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COMPUTATION OF THE VALUE OF THE WEALTH IN EXISTENCE.

By George K. Holmes.

The estimating the value of the wealth of the people of a country, or a portion of a country, is so difficult a matter that every attempt to do so has been more or less unsuccessful. Valuations by tax assessors are naturally inaccurate, and they are not only inaccurate but are extremely variable. It was determined by the Illinois Bureau of Labor Statistics,* by examining the records of deeds of acre tracts, in which the amounts paid by purchasers were undoubtedly truly stated, that the assessors of Cook county, in which Chicago is situated, valued the acres, including improvements, at 7.26 per cent of their true value; while in Alexander county, in the southern and poorer part of the state, the acre tracts were valued at 94.46 per cent of their value. Varying undervaluations in that state and in all other states could be mentioned almost without limit.

Besides this error in assessors' statistics of the value of wealth there is a further one due to the escape from taxation

* *Sixth Biennial Report*, 1890.

of personal property. Every state can furnish notorious evidence on this point.

For the purpose of arriving at the true value of real estate, a method that is commonly employed is to adopt some opinion as to the degree of under-valuation by assessors, and correspondingly raise the values given by them.

The United States Census, in estimating the true value of taxed real estate in 1890, sent out inquiries to county and municipal officers empowered to assess property for the purposes of taxation, asking them to state what, in their opinion, was the relation between the assessed and the true value of the real estate assessed by them. To corroborate their returns, more than 25,000 similar inquiries were sent throughout the country to persons believed to be familiar with the value of real estate in their respective regions, asking their opinion as to the relation, and the reports received were carefully considered in connection with the reports of the assessors. In estimating the value of taxed real estate by small civil divisions, as was done in this way, there was the advantage of offsetting plus against minus errors.

In other branches of the census work the value of farms was ascertained by enumerators, who accepted the statements of their owners. Owners' estimates were accepted for the purpose of ascertaining the value of farm implements and machines, live stock, mines and quarries, and the capital employed in manufactures. The value given to railroads and street railways and equipments represents the cost of construction and equipment of the roads. The value of canals and of telegraph and telephone property was determined by the capitalization of net receipts at 5 per cent.

The foregoing are the usual methods adopted for determining the value of the wealth of a country, and, when performed with the care and labor that were devoted to the matter by the Census Office, produce totals that are probably not far from the true ones. Statistics of the value of wealth obtained in these ways represent wealth largely in its geo-

graphical situation and not always in its place of ownership. It would be practically impossible to determine the value of wealth owned in any region by any direct statistical process, no matter what allowance might be made for errors.

An inexpensive, indirect method of determining the value of wealth in the region where owned has been employed by European statisticians, and this method adopts the number of years constituting a generation as a multiplier into the value of wealth left by persons who die within a year, with an estimate of the value of wealth changing hands by gift. The accepted length of a generation in France is about 36 years, and gifts among the living being left out of account, 36 times the value of the wealth left by the persons who die within a given year would establish approximately the value of the wealth of the people of the region within which the deceased lived. The theory of this is that, if those who die leave their wealth to their children, all wealth will pass to children during the average period that elapses from the time of the child's birth to the time of his parents' death. But of course wealth is not always left to children. This objection is answered by the claim that a generation approximately stands for the average age of persons who take by inheritance or bequest from persons who are not their parents.

In such a country as France the multiplier is probably considerably greater than 36, on account of the *dot*, and perhaps the more prevalent custom on the part of parents of giving children financial assistance than in this country. A multiplier obtained in this way is theoretically sound. The difficulty is to establish it with as much as approximate correctness. In this country the length of the generation has not been established, but it may be assumed, from a comparison of death rates and the average age at marriage, that it does not largely differ from 36 years.

Another indirect method that has been employed to establish the value of the wealth of the country is the use of the death rate; for instance, if the death rate is 20 in a thousand,

one-twentieth, or 50, is used as a multiplier upon the value of wealth left by those who die within a year. But, on the one hand, this ignores the high death rate of children, who are generally not owners of wealth, and, on the other hand, the still higher death rate of those who are 55 years old and over, a very large proportion of whom are owners of wealth.

The following table shows the death rates of various age periods in Massachusetts in 1890: —

DEATH RATES IN MASSACHUSETTS BY AGE PERIODS, 1890.

Age Periods.	Percentage of Deaths of Population.		
	Total.	For Males.	For Females.
Massachusetts	**1.94**	**2.00**	**1.89**
Under 25 years	1.83	1.94	1.72
25 to 29 "	0.87	0.89	0.85
30 to 34 "	1.00	1.01	1.00
35 to 39 "	1.08	1.07	1.10
40 to 44 "	1.22	1.21	1.23
45 to 49 "	1.48	1.49	1.48
50 to 55 "	1.78	1.90	1.67
55 to 59 "	2.40	2.53	2.29
60 years and over	6.20	6.40	6.02

The way is now prepared for offering a method of computing a multiplier, and, at the same time, of determining indirectly the length of a generation. The use of the death rate properly corrected and the use of the generation are both theoretically correct; and the two multipliers should agree if the death rate can be properly corrected and the length of a generation correctly determined. If we can only select the wealth owners from the population and from those who die, by age periods, a death rate of wealth owners can be computed. In the table next presented an attempt is made to do this: —

DEATH RATE OF FARM AND HOME OWNERS IN MASSACHUSETTS BY AGE PERIODS. 1890.

Age Periods.	Population.	Deaths.	Percentage of Farm and Home Owners of Population.	Population Multiplied by Third Column.	Deaths Multiplied by Third Column.
Total.....	2,238,943	43,528	.....	175,029	5,464
Under 25 years.....	1,050,936	19,220	0.14	1,471	27
25 to 29 "	220,628	1,921	2.54	5,604	49
30 to 34 "	185,252	1,857	6.35	11,764	118
35 to 39 "	156,370	1,695	9.83	15,371	157
40 to 44 "	135,536	1,651	13.68	18,541	226
45 to 49 "	117,645	1,745	17.61	20,717	307
50 to 54 "	102,595	1,827	21.31	21,863	389
55 to 59 "	75,536	1,815	25.79	19,481	468
60 years and over...	187,944	11,648	32.04	60,217	3,723
Unknown.....	6,501	149	.....	.....	.....

$\frac{5,464.00000}{175,029} = 31.22 =$ death rate of farm and home owners.

$\frac{1,000.0000}{31.22} = 32.03 =$ multiplier, without allowance for gifts.

$\frac{1,100.0000}{31.22} = 35.23 =$ multiplier, with allowance for gifts, amounting to 10 per cent of estates left at death.

The first two columns of the table explain themselves. The third column is obtained by dividing the farm and home owners of each age period in Massachusetts by the population of that age period, and representing the quotient as a percentage. The fourth column contains the farm and home owners who are equal to the product of the first and third columns. By multiplying the second column by the third the farm and home owners are selected from those who die during the year, and these are placed in the fifth column.

The assumption is that the owners of farms and homes own nearly all the wealth of the state, sufficiently so, at any rate, to make their death rate substantially the same as the death rate of all wealth owners. Therefore, the death rate of the wealth owners of Massachusetts is 31.22 per thousand, and this number divided into 1,000.0000 equals 32.03, which is

the sought for multiplier, without allowance for gifts. In other words, this is the length of a generation in Massachusetts.

I would make no great allowance for gifts in Massachusetts, nor anywhere in this country. It is not the practice to give a daughter a dowry, nor to help a son in business or otherwise financially by an outright gift. If a father advances wealth to a son he generally takes back a promissory note, and provides in his will that the debt shall be charged against the son's share of the estate, so that the debt goes into the probate court as assets.

Probably the most common and most considerable of gifts is that of a home by husband to wife. The census investigation of farm and home proprietorship throws some light upon this matter, and enables us to determine, probably without great error, the extent to which allowance for this gift should be made. It has been ascertained that 9.94 per cent of the farms that are occupied by owners in the United States are owned by women, and that, of the owned homes, women are the owners of 25.11 per cent. The percentages are a little higher for Massachusetts and the eastern states. It is a matter of observation that farmers, while living, rarely give their farms to their wives, and, if wives and other women inherit homes to about the same extent that they inherit farms, the difference between these two percentages will give the percentage of owned homes that were given to wives. I should regard this as the maximum percentage of wealth that changes hands by gift in this country, and consequently should adopt a smaller general average for correcting the multiplier, say 10 per cent; then by dividing 1,100.0000 by the death rate of the wealth owners, namely, 31.32, the multiplier, with allowance for gifts, is fixed at 35.23.

This multiplier may be applied to the value of the personal estates probated in the Orphan's Court of Baltimore. The *Third Annual Report of the Bureau of Industrial Statistics* of Maryland, recently issued, shows the value of these estates

for the six years 1888 to 1893, and the division of this number by 6 gives $9,842,595 as the average yearly amount. If this is multiplied by 35.23 the product is $346,754,622, which, according to the computation, stands for the value of the personal property owned in Baltimore, including, doubtless, much personal property situated outside of that city, and not necessarily including all of the personal property situated within the city. This large number indicates that the multiplier is none too small. The assessed valuation of personal property in 1890 was $68,696,614, so that if the correct value of the personal property owned in Baltimore has been reached by the computations, $278,058,008 of personal property escaped taxation, partly by under-valuation, but, as it seems, mostly by entirely escaping assessment.

The results contained in this paper are offered for no more than they are worth, and are intended to be suggestive instead of conclusive.

REMARKS OF MR. EDWARD ATKINSON.

I have given some attention to the various methods which have been adopted to determine the wealth of a state or nation by measuring it at so many dollars worth, and I have finally come to the conclusion that all these computations partake of the nature of statistical rubbish. I do not use this term as a stigma. I doubt not that Mr. Upton's compilations of the wealth of the United States are as close to the mark as it is possible to make them, but even if we had positive assurance that they were exact, *cui bono?*

In the first place, the valuation of land is included without separation from the improvements upon it. We therefore have no clue to the accumulation of capital. We have no means of discriminating between the valuation which is due to the land having been cleared and put under productive cultivation and the price which is paid in cities for the mere choice of lots.

In the second place, no valuation is or can be put upon public highways, although, as I understand the case, public buildings are included. If one, why not the other?

In the third place, the most potent factor in the progress of general welfare is the destruction of wealth by inventors, and through the application of new discoveries in science. For instance, there are many railroads which still stand at a capital valuation made when steel rails cost over $100 a ton, and locomotive engines over $20,000 each. No such corporation can expect to maintain an earning power on such a valuation against a line constructed on the basis of rails at $20 a ton, and locomotives at $7000, with other elements of cost in the same proportion. The same destruction of capital by way of improvement is constant in every factory and workshop.

Yet these figures of national wealth, as computed by Mr. Upton and dealt with by Mr. Holmes, possess a singular interest, and may serve as good working hypotheses for the study of social factors.

Mr. Upton computes the national wealth in 1890 at approximately $1000 to each inhabitant. Of what does this apparently consist when dealt with in detail?

REAL ESTATE WITH IMPROVEMENTS.

		Per Cent.
Land probably about one-half,	30.00	
Inprovements,	30.84	60.84
Railroads and equipment,		13.36
Miscellaneous,		12.10
Machinery of mills and product on hand,		4.70
Live stock on farms, implements, and machinery,		4.16
Mines and quarries, including product on hand,		2.00
Gold and silver* coin and bullion,		1.76
Telegraphs, telephones, shipping, and canals,		1.08
Total,		100.00

* How is the silver rated?

If this percentage is approximately correct, and the average apportionment of $1000 per head is also somewhat near the mark, some curious deductions may be made and questions put.

Total valuation,	$1,000
Deduct land,	300
Remainder,	$700

Suppose we could stop work and live on our $700 worth of apparent capital by converting it back into food, fuel, clothing, and shelter, out of which the energy was derived by which we saved it, how long would it last?

If all this capital were reduced to the figures which would fairly represent the cost of its reproduction at the present time by modern methods, and with the use of modern appliances, would it not be reduced about one-half, and would not the new capital at the reduced valuation be vastly more efficient and productive? Do not all these computations and interrogatories lead directly to the explanation of the apparent anomaly which we find in the conditions of this country since the end of the civil war?

In spite of every possible stupidity in financial legislation on the currency, the banking system and the collection of revenue by a succession of Congresses, each one apparently more incapable than the last, without distinction of party, have not the men who do the real work of the country, in the face of legislative obstructions, brought about conditions under which, while capital has secured a larger aggregate product year by year, that profit has constituted a lessening proportion of each year's product; while, on the other hand, have not workmen secured year by year an increasing share or proportion of a constantly increasing product?

These conditions have, of course, been subject to temporary variations, like those of the panic of 1893, in which year a paralysis of industries occurred, due wholly to tampering with the standard or unit of value.

EFFECTS OF FREE SURRENDER AND LOAN PRIVILEGES IN LIFE INSURANCE.

By Miles Menander Dawson.

The custom of deducting somewhat from the cash assets contributed by a policy in fixing its surrender value is perhaps universal; the only variation is as to the amount thus deducted. This practice is principally defended upon the ground that withdrawals from an office tend to lower the average vitality of the lives insured. This assertion is justified by *a priori* reasoning, as follows: The more robust lives are more likely to withdraw, the less vigorous to remain at all hazards. The premiums of the office are calculated upon certain mortality assumptions which may be vitiated by such adverse selection. The imposition of a surrender charge will tend to discourage such voluntary surrenders, and will also recompense the office for the impairment of the average vitality of the lives insured. If the surrender charge be made more than is required to offset this damage, it will the more deter such voluntary surrenders, and if surrenders still occur, they will therefore occasion a gain and not a loss for persisting policy-holders. In this no mention is made of the surrender charge championed by Elizur Wright and incorporated into the cash surrender law of Massachusetts, a charge imposed in order to cover the cost of obtaining a new life in the stead of the one withdrawing. This is really merely a correction of the error made in the calculation of reserves by what is known as the net valuation method, which assumes that the expenses incurred because of a policy are the same amount each year, while the fact is that the expense of the initial year is much the greater. The consequence of employing this system of computing reserves is to make the assets of a policy, especially in its earlier years, considerably larger than the fund really contributed by the policy is. A surrender

charge to revise such an error cannot properly be criticized; it only remains to deplore that the system of valuation is not made to square better with the facts, especially since solvency is a matter of fact.

Nothing in life insurance which has not been demonstrated by concrete fact seems so reasonable as the assumption that a serious adverse selection takes place by the conscious withdrawal of good lives. Yet the sole phenomenon which tends to support this view is that of the increase of mortality each year upon freshly selected lives, an increase diminishing in rate as the date of selection becomes more remote. This phenomenon, however, has never been demonstrated to proceed from adverse selection, but, instead, merely from the wearing off of the benefits of the original selection. It has as yet not proven feasible to discover whether the mortality in lives withdrawn is more favorable than in lives remaining. It could hardly be demonstrated otherwise than by observation of the vital history of withdrawn lives, a thing not without difficulties. Comparisons of the mortuary experience of companies which allow liberal values on surrender and companies which are less liberal have so far not yielded any support to the theory of adverse selection. Dr. Emory McClintock, in his paper on "The Effects of Selection," acknowledges this, but remarks: "So potent is theory, however, that I prefer to believe." And, indeed, the abstract reasoning is very convincing, especially if one is not accustomed to consider how little reliance may be put in any calculation based upon the motives of human action. Directly in this connection an instance of the perversity of human nature may not be out of place. A certain man, who was insured in a strong American office on a limited payment life plan, was in feeble health, and in somewhat reduced circumstances, when his premium fell due. Distrusting his own sagacity, he sought his banker and counselled whether to pay the premium out of his diminishing store. The banker's sage advice was to take a paid-up fractional policy and default in

the payment of the premium. The insured did the latter, accordingly, but neglected to attend to the former. He died, leaving no insurance whatever legally in force. This is only an unusually flagrant example of a common case of stupid carelessness in matters of importance. Theories, therefore, which depend wholly upon man's self-interest are not sure to stand.

The first and most important defence of the system of surrender charges is on the ground of necessity. The experience of the National Life Insurance Co. of the U. S. disproves this theory; since, without new insurance, and with a constantly decreasing volume of business, and although discredited, its mortality has not at any time materially exceeded the expected deaths according to the 17 Offices' Tables, and has usually been much smaller.

Since, then, surrender charges are not justified by sheer necessity, it remains to consider whether they are to be desired to protect persisting policy-holders from loss or to procure for them gain. The first of these involves the question of avoiding a loss, the second the question of making a profit. Between these two there may be a moral issue, as some contend, but it is foreign to the purpose of this paper to discuss it. The contention that the imposition of such charges tends to deter men from surrendering because of dread of loss, or to induce them to continue in the hope of gain, also requires attention, though it is at once evident that at the very moment, when on the assumption that a gain may be made by forfeitures, discontinuance would be profitable, the deterring influence would be strongest and *vice versa*.

Before entering upon these inquiries, however, it may be well to pause and consider for a moment two common objections to allowing full surrender values which are urged rather by business men than by actuaries. They contend that in times of financial stress it might be possible for withdrawals to assume the threatening form of a "run," carrying down the company. This, again, is calculating upon the motives

of human action. Men do not think of life insurance companies as mere banks of deposit, and, despite the squally times of 1893, no such runs have ensued. If the practice of paying liberal cash surrender values became common, there would be no need for a law commanding it, or for a clause in policies promising it, in which case companies would be able to suspend such payments if found necessary. At the present many companies avoid this difficulty by stipulating for surrender only at the anniversary of the policy, or upon certain notice, and at other times make the cash allowance a matter of courtesy. The other contention is that to offer such values is practically to put a premium upon surrender, more especially during times of financial reverses, and that the rate of discontinuance is thereby augmented. Of course, unless it is proven that this increase in surrenders inflicts an injury upon the office, this argument has little weight. Whether in practice it plays a considerable part is also doubtful, since financial reverses which compel one thus to surrender would also be likely to compel him to discontinue for want of means to meet premiums. And the objection is certainly obviated by offering advances within amount of the assets of the policy upon the security of the policy itself. Such is the common, if not the universal, practice of companies, which allow liberal cash surrenders, and the two things are considered together in this paper. The only great company with which I am familiar, which allows liberal cash values, but does not allow loans, shows a considerable falling off of surplus earnings as the result of 1893 experience.

If the imposition of a surrender charge has any influence in deterring persons from discontinuing through fear of loss, it has not yet been discovered in insurance statistics. In his address to the Russian government, in defense of the tontine system of his company, Rufus W. Weeks, Actuary of the New York Life Insurance Co., brought forward as evidence on this point a comparison of discontinuances of tontine and ordinary bonus policies in his company through a like term

of years. But, in addition to the fact that this statement is made in a special plea, which alone discredits it for use elsewhere, we discover that the ordinary bonus policies of the company were subject also to a heavy surrender charge; the comparison is, therefore, only between surrender charges, both heavy, but of different degrees. The policies which were wholly forfeited at death were all sold, with the hope of large returns during life, as an inducement, and were sold during a year of commercial crisis, 1873, to men who, in such times, had confidence in their own financial ability, so that they dared to go into a speculation, offering big returns, but at a risk of the loss of all. These men were then strongly influenced to continue by their expectation of large returns. To compare such policies thus obtained with policies of all sorts, in the main bought for life insurance only, and returning each year a more disappointing bonus, is manifestly unfair if the purpose be to show the effect of forfeitures in discouraging discontinuances. The unfairness is greater if, as has been charged publicly, but not denied, the statistics concerning the tontine class have reference to policies issued during panic years to persons still solvent, and the statistics concerning ordinary bonus policies refer to policies issued before the panic to persons, many of whom were ruined by the panic. All of these considerations lead us to reject the comparison as having no proper bearing upon the questions we are considering.

The rate of discontinuances in offices allowing liberal surrender values is not greater than in others which do not. No company of the latter sort, whose statistics are accessible, shows so remarkable persistency on the part of its policyholders as the Australian Mutual Provident Society, which, all in all, perhaps allows more privileges in the way of liberal cash and loan values than any other office. This institution, which is now in its forty-seventh year, has in force over 60 per cent of all the insurances it has ever effected.

For statistical exemplification, the questions as to whether

there is a loss because of adverse selection by discontinuance, whether this loss can be made good through a surrender charge, whether by means of a surrender charge persons may be led to retain their policies, and whether by increasing the surrender charge a profit may be made over the loss occasioned by the discontinuance, may be regarded as one inquiry. As the two extremes of low and high surrender charge and liberal and illiberal privileges do not exist in any one company at the same time, it is not easy to institute comparisons which will be convincing. The good fortune to be able to do this has come to me at this time through the especial courtesy of Mr. C. A. Loveland, Actuary of the Northwestern Mutual Life Insurance Co., of Milwaukee, U. S. A., and Mr. Richard Teece, Actuary of the Australian Mutual Provident Society, of Sydney, N. S. W. These two companies are much alike in unimportant as well as important particulars. They are in possession of nearly a like amount of invested funds, the Northwestern holding the larger amount of total insurance, however, and being just ten years the junior. Each company enjoys, in its own field, the reputation of paying the largest bonuses, and each confines its business strictly to its own country. In essential particulars the resemblance is even more remarkable. The mortality experiences of both companies are exceedingly favorable in comparison with the standard tables. The actual deaths in the Australian Mutual Provident Society have been under 70 per cent of the expected deaths, according to the HM Table, and the experience of the Northwestern Mutual Life Insurance Co., which will shortly be given to the world, shows mortality of near 70 per cent of the expected, according to the 17 Offices' Table. There is also a marvelous correspondence between the rates of interest realized by the two institutions during each of the last ten years on their mean assets. The rates for years 1883 to 1892, inclusive, are as follows: —

Year.	Northwestern Mutual.	Australian Mutual Provident.
1883	6.17	6.04
1884	6.18	6.16
1885	6.08	6.17
1886	6.07	6.10
1887	6.24	6.04
1888	6.03	6.00
1889	6.12	6.05
1890	5.86	5.96
1891	5.91	5.96
1892	5.68	5.94

The figures relative to the Northwestern are copied, without verification, from the *Definitive Analysis of Life Insurance Returns*, by B. F. Brown, which is incorporated into the *Insurance Year-Book*, and the figures relative to the Australian Mutual Provident are also taken without verification from a publication of the Society. The interest of each is expressed in decimals, which may be understood as pounds or dollars, as may also all other figures denoting money throughout this paper. The interest factor used by the Northwestern during this ten years in determining bonuses and in computing the accumulation of tontine surplus was not once altered. Consequently, the fall of interest during 1892 will not affect these or the following figures. The Australian Mutual Provident experienced a similar fall of interest rate during 1893.

These companies, which are so similar in so many bonus-determining regards, are widely dissimilar in their attitude on the surrender and policy-loan questions. Under the guidance of the learned and conservative Dr. Emory McClintock, now Actuary of the Mutual Life, of New York, the Northwestern has most consistently acted upon the theory that discontinuances cause adverse selection; that surrender charges of considerable magnitude both discourage surrenders and offset their effects, and, if carried beyond the point of equalling the loss, form of themselves an element of profit. On the contrary, the Australian Mutual Provident, under the guidance of Mr. Richard Teece, has granted very liberal surrender values from the first year of insurance, and has

extended the benefits of policy loans to a very unusual degree. This company also pays all its bonuses annually, and in reversion with the privilege of conversion at any time, without conditions as to health. The Northwestern pays its ordinary bonuses annually in cash, with the option of applying them in reversion, if evidence of good health is given at the time of electing so to apply them, which cannot be earlier than when the first bonus is paid, at the end of the second policy year. The company also issued policies with tontine and semi-tontine bonus periods of ten, fifteen, or twenty years. The tontine policies are wholly forfeitable upon discontinuance before the expiration of the period, at which date of expiration, however, the surrender for cash of the policy is permitted, and all the reserve and surplus is payable without deduction, and including the policy's share of the assets of discontinued policies. The semi-tontine policies differ from these only in that the surplus alone is considered forfeited upon discontinuance, the same value in cash or otherwise being given as if the policy were an annual bonus policy. This cash value, however, represents a very considerable surrender charge.

The premium for a policy in the Northwestern Mutual of one thousand dollars or pounds, expressed decimally, is 26.49 per annum, at age 35, on the whole life tables. The bonuses paid in cash and reversion on such a policy issued in 1883, and for each year up to and including 1892, were as follows: —

Year.	Cash Bonuses.	Reversions.
1885	7.12	20.00
1886	7.51	20.60
1887	7.73	21.00
1888 (double)	15.70	43.20
1889	7.98	22.20
1890	8.21	22.60
1891	8.46	23.00
1892	8.72	23.60
1893	9.00	24.20
	80.43	220.40

The reserve value of the reversions is 94.45. A memorandum of surplus accumulations on a tontine policy, issued at the same age, and on the same plan, reads as follows: —

Year.	Ordinary Surplus.	Lapse Profits.	Loss Profits.	Brought Forward.	Interest.	Total.
1885	6.85	....	.20	....	....	7.05
1886	7.51	1.51	.09	7.05	.39	16.55
1887	7.73	.44	.65	16.55	.91	26.28
1888	15.70	.64	.72	26.28	1.44	44.78
1889	7.98	.72	.60	44.78	2.47	55.95
1890	8.21	.21	.72	55.95	3.08	68.17
1891	7.93	....	2.37	68.17	3.75	82.22
1892	8.19	....	1.33	82.22	4.11	95.85
1893	8.47	....	.78	95.85	4.30	109.90

This policy was issued in a state which imposed upon the premiums a percentage tax, which was deducted from the ordinary surplus before it was entered in the first column. The actuary informs me that the total surplus would be more by 1.85 if the policy had been in a state where no such tax was imposed. Adding this to the total surplus, we have 111.75 as the surplus which the company would pay under the most favorable circumstances. The heading "loss profits" may need explanation; these are the gains or abatements which come from the forfeiture of the bonuses of those who die during the term. It will be observed that the apparent or book profits from discontinuances are very small,— indeed, are insignificant. The absence of discontinuances during the last three years is significant of the approaching maturity and the hope of gain; doubtless, the fear of loss, which would be equally great were the period of 15 or 20 years, would not operate in that case to so completely prevent discontinuance during the eighth, ninth, and tenth years as in this case. The approaching maturity must account for this. The company issued no semi-tontine policies so early as 1883. The reserve value of the original policy, when 10 years old, would in each of these cases, without regard to dividend or bonus plan, be 133.41 by the 17 Offices' Table and 4 per cent, which form the standard for net valuation in use by this company. By combining this reserve with the cash surplus, with the reserve value of the reversions, and with the tontine surplus, we get the total policy assets under each bonus system at the

expiration of 10 years. It must be borne in mind, however, that in the case of the tontine policy alone could the policy then be surrendered for the whole assets. The figures are as follows: —

	Cash Bonuses.	Reversions.	Tontine.
Policy Assets,	213.84	227.86	245.16

The book, or apparent, profit realized from surrender charges was trifling, as is clear even when the surrender charge was the whole assets of the policy. This is further illustrated by comparing the total surplus accumulated upon a tontine policy with a similar accumulation upon a semi-tontine policy on the same plan, at the same age, and of the same year of issue. The plan is ten-payment life, the age 32, and the date of issue 1884. The bonuses were as follows: —

Tontine.	Semi-Tontine.
139.19	128.78

The Northwestern apportions its surplus by the contribution plan, as devised by Mr. Sheppard Homans. The Australian Mutual Provident Society varies from this plan only in dividing the gain from investments by the contribution formula and the salvage from mortality and expense estimates together, in proportion to the loading, which method favors endowment policies, because of the large amount of loading. The premium for a life policy for one thousand pounds, or dollars, at age 35, in the Australian Mutual Provident, expressed decimally, is 27.67. The following is the bonus statement of such a policy issued in 1883, all bonuses in reversion: —

Year.	Year's Bonus.	Total Bonus.	Amount at Risk.	Surrender Value.
1883	22.50	22.50	1000.00	.....
1884	24.30	46.80	1000.00	.....
1885	24.60	71.40	1071.40	53.56
1886	26.70	98.10	1098.10	73.61
1887	26.90	125.00	1125.00	94.48
1888	29.60	154.60	1154.60	124.68
1889	30.70	185.30	1185.30	150.01
1890	31.90	217.20	1217.20	176.93
1891	31.40	248.60	1248.60	204.73
1892	31.20	279.80	1279.80	233.63

In this table the years have reference to the time within which the bonus was earned; in the Northwestern to the year when the bonus was paid. The Australian Mutual Provident computes the bonuses the first and second year, but they do not attach until the third year begins. The Northwestern withholds one bonus for five years, and then adds it to the fifth year's bonus. Dividends in reversion in the two offices compare as follows: —

Northwestern Mutual.	Australian Mutual Provident.
220.40	279.80

Taking into the account the higher premium of the latter office, these bonuses are approximately equal. Whatever difference there is is in favor of the policy of the Australian Mutual Provident. This difference is much enhanced when we compare policy assets by adding the reserves to the value of the surplus. The Australian office reserved at this time by the HM5 Table for policies more than five years old and 4 per cent; the Northwestern by the 17 Offices' Table and the same rate of interest. The total assets thus computed are —

Northwestern Mutual.	Australian Mutual Provident.
227.86	252.55

The latter exceed even the assets of a full tontine policy in the Northwestern (245.16).

To recapitulate, we find that even in the matter of book or apparent profits the gain from surrender charges forms but an insignificant part of the entire bonuses. That even this small gain is more apparent than real is clear from the fact that the Australian office, operating under conditions almost exactly similar, but allowing liberal privileges in cash surrenders and loans, pays bonuses at least equal to those of the Northwestern office, besides retaining a heavier reserve.

To offset this apparent or book profit there must, therefore, be a corresponding loss in some other quarter which ordinarily escapes observation, because seemingly disconnected from the subjects we have been considering. This element will, I apprehend, be found to be the element of expense,

which is too often absent from actuarial calculations. The harsh forfeiture conditions tend to make men withdraw very early in the history of the policy if at all, and often before the office has recouped itself for the outlay to procure the policy. Besides, the fear of loss, bred of experience, causes an unusual and unnatural hesitation about embarking in insurance investments. It requires an uncommon, if not a high, order of talent to overcome that disposition by persuasion; consequently, higher commissions must be paid. When the community has come to expect a loss for a large majority of those who purchase insurance, the task is yet harder, and few embark, if not over-persuaded, unless they can "see their way clear," as runs the phrase, which is familiar to the solicitor. All this calls for increased outlay. Consequently, we are not surprised to find the tontine companies paying the largest commissions, nor to find all companies paying higher commissions where these penetrate. Neither does it surprise us to find that in every community the companies allowing liberal privileges in the matter of loans and cash values pay the smallest commissions.

Accordingly, as we might expect, we find the difference between the Northwestern Mutual's bonuses and those of the Australian Mutual Provident explained by the difference between the costs of procuring and retaining policies. The commissions paid for new insurance by the Northwestern average over 50 per cent of the premiums; commissions for collecting renewal premiums average about 6 per cent, but are 7½ per cent to those who originally procured the insurances. The Australian office pays as a commission for new insurances only about one-third of the premium on the average, and no more than 3 per cent for collecting renewal premiums. The effect of this difference upon the expense, as compared with premium receipts, is seen in the following table: —

PERCENTAGE OF EXPENSES TO PREMIUM INCOME.

Year.	Northwestern Mutual.	Australian Mutual Provident.
1883	24.0	13.8
1884	22.3	16.8
1885	22.5	15.7
1886	24.2	15.3
1887	23.1	13.9
1888	23.3	12.9
1889	23.4	14.1
1890	22.8	14.0
1891	22.1	14.2
1892	20.8	14.0

Mere inspection shows that this difference is sufficient to compensate for a more considerable book profit from discontinuances than we have been able to discover. It must be borne in mind, also, that the Australian office has for its chief competitors the great American tontine companies, and that it succeeds, notwithstanding, in procuring a larger volume of new insurances annually in proportion to the population of the field it covers than any other office in the world. It is a natural result, however, of the long continued practices of the American companies in these regards that those who in Australia would be the easiest procured patrons, the men who wish life insurance for its own sake, are in America the chief patrons of assessment companies where they entrust the company with no policy assets to withhold upon surrender.

It has already been mentioned that the mortality experience of the Australian office is somewhat the lower, though both companies have had very favorable experiences. This superiority might bear against the theory of adverse selection were it not that the rate of discontinuances in the Northwestern is many times greater than in the Australian office. The low mortality and discontinuance experiences thus together prove that there are no such perils attending liberal surrender and loan privileges as have been imagined. Indeed,

it is found that offices which grant these privileges hold their business best even during seasons of wide-spread distress, and that in such times especially they are favored by the public in the purchase of new insurance. The Scottish Widows' Fund of Edinburgh, which is exceedingly liberal in the matter of surrenders and loans, actually procured more new insurances during the troublous year of 1893 than during the relatively prosperous year of 1892. The New York Life also made excellent field use of its small concession in loans. By way of comparison with the Scottish Widows and the Australian offices, the actual transactions in new insurances, etc., are given herewith of one of the great American companies doing business in those fields: —

IN AUSTRALIA AND NEW ZEALAND.

	The Australian Office.	The American Office.
New insurances for 1893..	£2,859,997	$2,588,645
Void from all causes.	2,417,209	2,910,055

IN GREAT BRITAIN.

	The Scottish Widows Office.	The American Office.
New insurances for 1893	£1,434,500	$3,974,776
Void from all causes.	475,900	2,550,810

The Australian and British offices' figures are given in pounds, and the American office's in dollars, as I received them. Since it is only intended to point out the comparative ratios, no conversion is necessary, and I have not troubled to make one.

From all the foregoing facts the following conclusions are properly deducible, viz., there is no evidence that there is such a thing as adverse selection by discontinuance in any office which possesses the confidence of the public; in any case such adverse selection in offices which are not already ruined stops short of vitiating calculations based upon the

standard tables of mortality; the imposition of a surrender charge even to the extent of total forfeiture seems to increase discontinuances instead of diminish them, except as the hope of gain thereby operates to prevent this; this hope of gain is not warranted by the facts, for, while there is an apparent or book gain, the thereby increased cost of procuring insurances more than compensates for it; in times of financial crisis and stringency offices allowing liberal cash value and loan privileges do not suffer more from withdrawals than do others, while they do receive the favor of the public in the purchase of new insurances.

WAS THE COUNT OF POPULATION IN 1890 REASONABLY CORRECT?

By Henry Gannett.

The Census Office has recently prepared tables showing the distribution of the population by periods of age, classifying them also by race and nativity of parents. The appearance of these tables enables anyone to make a tolerably searching test into the completeness of the enumeration. It will be remembered that this census was the subject of violent attacks, the grounds of the attacks being the reduction in the rate of increase of the population in the face of an unprecedented immigration. Most estimates of the population in 1890 placed our number from one to several millions more than the enumeration showed, and the disappointment of the people was very great.

Comparisons were instituted between the results of this census and those of school censuses, of elections, of directory counts, and, above all, of *ex-parte* enumerations made by the people interested, all to the disadvantage of the census.

In the case of a defective enumeration the omissions are more likely to consist of colored persons than of whites, of the lower classes than of the higher classes, and of the young children rather than of adults.

A census is taken each ten years. Leaving out of consideration all persons of foreign birth, those of native birth enumerated in 1880 who were living in 1890 were at that time over ten years of age. Therefore, the number enumerated in 1890 as being over ten years of age, plus the number who had died in the ten-year interval, a number which can be estimated closely from the known death rate, should, if the census of 1890 was complete, be found to correspond closely with the total native-born population in 1880.

First, as to the rate of mortality. Upon page 25, volume I, Report of the Tenth Census on Mortality, Dr. Billings prints a table showing the number of living population at various ages, and the number of deaths at those ages. The number of deaths is admittedly incomplete to an extent, he states, of 15 to 30 per cent. The death rate at all ages collectively as derived from these is 15 per thousand living per year. From other considerations Dr. Billings concludes that this

rate should be increased to 18 per thousand per year, increasing that given by the face of the returns by 20 per cent. The death rate for persons over one year of age is, from the returns, 12.2 per thousand. Increasing this in the same proportion it becomes 15. Similarly for those over two years of age the death rate is 13.3, etc. In this way the death rate was obtained for the total population above each successive year of age up to ten years. Applying these death rates successively to the native population in 1880, 43,475,840, and subtracting the deaths thus obtained from the population, there is obtained, finally, as the native population surviving in 1890, over ten years of age, 37,879,000. This is the number over ten years of age which, assuming the Tenth Census to have been taken correctly, and the death rates assumed to be accurate, should have been returned by the Eleventh Census. To what extent do the returns of that census differ from these figures? The census of 1890 found of native born above the age of ten years 37,498,992. The difference between them is 380,000, or about one per cent. In other words, the native population ten years and over in 1890 is found to be short, according to the Eleventh Census, about one per cent, as compared with the count of the same persons in 1880, reduced by the estimated number of deaths.

Before deciding that the census of 1890 was in error, however, to the extent of one per cent, let us see what other possibilities there are in the case which may account for this discrepancy. If the death rate had been assumed a single unit larger, that is, 19 instead of 18, etc., it would have accounted for this discrepancy in full. Of course, it may be added that if a smaller death rate had been assumed the discrepancy would have been larger, to which the reply is that the death rate assumed was smaller than in any other country on the globe, and much smaller than that indicated by the registration cities.

No account has been taken of the persons of native birth who during the ten years have left this country. Their number is certainly not inconsiderable, and may, to a considerable extent at least, offset this discrepancy.

A table classifying the population by age, with sex, race, and nativity, recently finished by the Census Office, furnishes the means of criticising the returns of children of native birth who are under 10 years of age.

This table shows that the native white children under 10 years of

age constituted, in 1890, 27.8 per cent of all native whites. The corresponding proportion in 1880 was 30.1 per cent, showing a diminution of 2.3 per cent. In 1890 the colored children under 10 formed 28.1 per cent of all colored, and in 1880 31.8 per cent, showing a reduction of 3.7 per cent. Both these reductions, and especially that in the case of the colored, are larger than was to have been expected.

To examine these figures in greater detail let us set down in tabular form the proportions which children of the two races and at various ages bore to the totals of those elements at each census.

NATIVE WHITE.

	1880.	1890.
Under 1 year	3.3	2.9
1 to 5 years	15.6	14.2
5 to 10 years	14.5	13.6
10 to 15 years	12.6	12.2

The above shows that in 10 years the proportion of children under one year of age diminished by 0.4 per cent, or about one-eighth of their proportion. The children under 5 years diminished by 1.4 per cent, or by nearly one in 10, and those between 5 and 10 diminished 0.9 per cent.

COLORED.

	1880.	1890.
Under 1 year	3.4	2.7
1 to 5 years	16.5	13.8
5 to 10 years	15.3	14.3
10 to 15 years	12.4	13.7

The colored children less than one year of age diminished 0.7 per cent, or more than a fifth of their proportion, in 1880. Those under 5 years of age diminished 2.7 per cent, and those between 5 and 10 diminished 1.0 per cent. These reductions in the proportions from 1880 to 1890 are too large to be at all probable. There is, however, more convincing evidence still of a shortage among these ages than this. The native whites under 5 years of age in 1890 exceeded those between 5 and 10 by a small amount, not by any means sufficiently

large to allow for the large death rate of the first 5-year period of life. Among the colored the number given as under 5 years of age in 1890 is less numerically than that between 5 and 10 years of age, a condition of things which is extremely improbable. While the number of native whites under 5 years of age in 1890 exceeds the corresponding number in 1880 by 13 per cent, the number of colored under 5 years of age in 1890 is absolutely less than the number in the same age period in 1880.

This evidence appears to indicate a shortage among the negro children amounting perhaps to a quarter of a million. The shortage among the native white children is by no means as great proportionally, but may amount numerically to about the same.

There remains to be examined the element of foreign birth. In 1880 this country contained 6,679,943 persons of foreign birth. During the decade 5,246,613 immigrants arrived, which would have made altogether 11,926,556, providing none had died or left the country. The census found 9,249,547 foreign born in the country in 1890, leaving 2,677,009 to be accounted for. The great reaper accounts for about two-thirds of this number, leaving nearly a million unaccounted for. Probably most of these have returned, as the statistics of departures compared with those of arrivals indicate that between one-fourth and one-fifth of the immigrants return.

SOME RECENT CONTRIBUTIONS TO THE LITERATURE OF VITAL STATISTICS.

By Gary N. Calkins.

Among the many interesting and important works relating to the subject of vital statistics published during the past year we note a work of the first order, by Miss Brownell, on the "Significance of a Decreasing Birth Rate," which appeared in the *Annals of the American Academy of Political and Social Science*, July, 1894.

The normal decrease of the birth rate in all civilized countries has caused extensive discussion, and has led to many theories regarding the significance of the peculiar phenomenon. It has led, on the one hand, to the reconsideration of the Malthusian doctrine, and, on the other, to the study of many new questions in sociology. The Malthusian doctrine is shown to be, to a certain extent, true, but, as we might expect from the laws of biology and evolution, there is also an "enhanced cost of individuation," and, in consequence, a diminishing birth rate. Among the sociological questions brought into discussion are inequalities of production and consumption, voluntary prevention of conception, etc., due or, to a certain extent, caused by increasing civilization. These are considered the direct cause of the decrease in birth rate by Hansen, Longstaff, Fothergill, Billings, Edson, and others.

After a short review of the works of these different writers, Miss Brownell shows that the reasons advanced in explanation of the universal phenomenon, though pertinent, are insufficient to explain all of the phenomena attendent upon a decreasing birth rate. This the author demonstrates by showing that in the United States the same facts are true for white people, who represent the most advanced civilization, and for colored people, who represent a less advanced civilization. She concludes that since the same phenomena are current amongst whites and blacks we must look for some other explanation than causes which are true of only an advanced civilization.

Miss Brownell's data are taken from the United States Census Reports for 1880. She compares the birth rates of the white and colored population, and shows the relations between the birth rate and the death rate for nervous diseases, between the birth rate and

density of population, agricultural wealth, manufactured wealth, and the mortgage indebtedness. For convenience, the localities are aggregated in "grand groups," whose boundaries are determined by topographical peculiarities, and which are made up from 111 "state groups."

The first study is a comparison of the white and colored birth rates in the 10 grand groups in which the colored population forms 20 per cent or more of the total population. It was found that in four of the grand groups the birth rate was below the average for all whites in the 10 grand groups compared. Here also the birth rate of the colored population was found to be below the average birth rate of the colored population of the 10 grand groups. In four other grand groups the birth rates were above the average for both colored population and white, showing concurrence, therefore, in eight grand groups out of the ten.

In the state groups, also, it is shown that the birth rates rise and fall together, in relation to the average birth rates for whites and blacks, in 15 out of the 23 groups where the colored population forms 50 per cent or more of the total population.

From this concurrence of phenomena, in both state and grand groups, Miss Brownell concludes that "there must be some underlying cause that determines the birth rate of both white and colored population." The voluntary prevention of conception, which is considered by a number of statisticians to be the chief cause of a decreasing birth rate, is shown to be entirely inadequate to explain the same phenomena among both whites and blacks.

The relation of the birth rate to the deaths from nervous diseases is very interesting and instructive. Nervous diseases are selected because the death rate from this class of maladies is taken as a rough indication of the degree of civilization. The author found that in the 21 grand groups wherever the birth rate is above the average the number of deaths from nervous diseases is below; or where the birth rate is below the average the death rate from these diseases is above; and in only two grand groups did the deaths from nervous diseases and the birth rate rise or fall together in regard to their respective averages. The same opposition of birth rate and death rate from nervous diseases is shown for 86 of the 108 state groups compared. The deductions which the author draws from these facts are as fol-

lows: (1) The conditions that caused a high death rate from nervous diseases lowered the birth rate, and *vice versa;* (2) in 39 states and territories out of the 47 the phenomena were opposed; in two-thirds of these the birth rate was above the average, and the death rate from nervous diseases was below, hence the deduction can be made that in the other one-third the variations above and below the average must be proportionally greater,—in other words, "the conditions of life which cause such variations must be more intense." Among the states included in this "one-third" are the following: Maine, New Hampshire, Vermont, Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Delaware, Maryland, the District of Columbia, and Ohio.

The same coherence is found between the birth rate and the value of manufactured products *per capita* and the value of agricultural products *per capita*. In 40 states and territories the birth rate and the value of manufactured products are opposed, 27 having a high birth rate and a low value of manufactured products. Twelve of these have also a low density of population, a low death rate from nervous diseases, and a low value of agricultural products per acre. Also, the value of agricultural products per acre and the birth rate oppose each other in 31 states and territories.

The same general results were obtained, so far as they were ready, from the census reports for 1890.

Miss Brownell draws the following conclusions from her study: (1) Whether or not it be true that the means spoken of by Dr. Billings, M. Dumont, M. Lavasseur, and Dr. Edson has become an important factor in the diminishing birth rate of civilized countries, it is evident that it is not the only factor, and that, quite apart from voluntary prevention, there is a distinct problem to be investigated. This is shown by the fact that the white and colored birth rates vary together.

(2) Mr. Spencer's generalization, that the birth rate diminishes as the rate of individual evolution increases, is confirmed by a comparison of the birth rates with the death rates from nervous diseases, and also with the density of population, the values of agricultural and manufactured products, and the mortgage indebtedness.

(3) The Malthusian theory in general, that population tends to increase faster than the means of subsistence, is not true of the United

States at the present time. In the regions where wealth increases most rapidly the population increases most slowly.

In connection with Miss Brownell's work it is interesting to consider the international vital statistics of marriages and births as published in the *Bulletin de L'Institut International de Statistique*, Vol. VII. A condensed account of the same statistical work is given in the *Allgemeines Statistische Archiv*, by Georg von Mayr, and the following figures are taken from the latter. The results cannot conveniently be expressed in one table of figures. In general, it may be stated that the marriages decrease, to some extent, as well as the births, and for all countries, although the number of marriages per 1000 population varies within certain limits, as does also the birth rate. First in regard to marriages.

For convenience, the countries are divided into grand divisions: Central Europe, Northwest Europe, Southeast Europe, Southwest Europe, Eastern Europe, and America.

The most uniformly high marriage rates are shown for the countries of Central Europe (Germany, Prussia, Bavaria, Saxony, Wurtemburg, Austria, Hungary, Switzerland, Netherlands, and Belgium). These countries average eight marriages to every 1000 of the population. The highest figures are shown for Hungary, with an average of 9.61 marriages annually since 1874. The lowest is Belgium, with an average of 7.05 per 1000. In Northwestern Europe (Denmark, Sweden, Norway, England and Wales, Scotland, and Ireland) the general average is lower (6.05 per 1000), and varies between the highest rate in England and Wales (7.66 per 1000) and the lowest rate in Ireland (4.45 per 1000). In Southwestern Europe (including France, Spain, and Italy) the average is 7.05 per 1000, the highest being 7.76 in Italy, the lowest, 6.78, in Spain. In Southeast Europe (Servia, Roumania, and Greece) statistics were collected for only a few of the 19 years. The figures for these years, however, are exceptionally high, the average being for Servia 10.4 per 1000. In Eastern Europe also (Russia and Finland) the marriage rate is relatively high (8.93 per 1000 for the former, and 7.56 for the latter). In America (Massachusetts, Connecticut, and Rhode Island) the rates vary between an average of 9.76 for Rhode Island, and 7.76 for Connecticut.

In every country of Central Europe, except Belgium, which has

remained about the same, the marriage rate has gradually decreased since 1874. The same is true of the division Northwest Europe, except Scotland and Ireland. In Southwest Europe the same phenomenon holds for France, and, to a less extent, for Italy. In Spain the rate decreased rapidly until 1888, but has increased steadily since that year. In Southwest Europe the rate has decreased for Servia, but remains about the same for the other countries. In Russia and Finland the rate has steadily decreased, as it has also in New England.

The general conclusions to be drawn from these marriage statistics are (1) the marriage rates in different parts of the world are only slightly different; (2) the *marriage rate since 1874 has steadily decreased in all countries*, a fact which may throw some light on the cause of the decreasing birth rate.

The birth rate for a series of years in various countries of the world is naturally interesting, but more especially so when we consider it in the light of Miss Brownell's work on the *Significance of a Decreasing Birth Rate*, and the degree of civilization of the countries considered.

TABLE I. BIRTH RATES FOR ALL COUNTRIES.

Country.	Average 19 Years 1874-92.	Birth Rate 1874.	Rate 1877.	Rate 1880.	Rate 1883.	Rate 1886.	Rate 1889.	Rate 1892.	Difference between 1874-92.	Increase or Decrease Marriage Rate.
Russia	49.2	50.4	48.6	48.7	49.5	48.5	49.2	48.5*	−1.9	−1.39
Hungary	43.8	42.7	43.3	42.9	44.7	45.4	43.6	42.3†	−0.4	−2.12
Servia	43.0	41.8	33.2	40.4	46.9	42.3	44.3	42.1	+0.3	−5.04
Roumania	42.5	....	....	....	....	42.2	42.3	42.0	....	.....
Saxony	42.3	44.1	44.2	41.7	41.3	42.0	42.8	40.0	−4.1	−1.53
Austria	38.5	39.7	38.7	37.7	38.3	38.2	38.1	38.4†	−1.3	−1.25
Prussia	38.4	39.8	39.6	37.7	36.3	37.6	37.0	36.3	−3.5	−1.60
Wurtemburg	38.2	43.7	44.0	39.8	36.7	35.7	33.5	33.9	−9.6	−2.06
Bavaria	38.0	41.0	41.6	38.3	36.7	36.6	35.9	34.9	−5.1	−1.85
Italy	37.7	34.9	37.0	33.9	37.2	37.0	38.3	36.4	−1.3	−0.13
Germany	37.7	40.1	40.1	37.6	36.6	37.0	36.4	35.7	−4.4	−1.60
Spain	36.0	....	36.0	35.4	35.6	36.9	36.4	35.9	−0.1	+1.36
Finland	35.5	37.7	38.0	36.3	35.6	35.1	33.2	34.0†	−3.7	−2.08
Netherlands	34.9	36.4	36.6	35.5	34.3	34.6	33.4	32.0	−4.4	−1.21
England and Wales	33.4	36.0	36.0	34.3	33.5	32.8	31.1	30.5	−5.5	−0.79
Scotland	33.1	35.6	35.3	33.6	32.7	32.9	30.9	30.8	−4.8	−0.54
Denmark	31.3	30.9	32.3	31.8	31.8	32.6	31.3	29.5	−1.4	−1.43
Norway	30.9	30.6	31.8	30.8	31.1	30.9	29.9	30.8†	+0.8	−1.07
Belgium	30.7	32.9	32.3	31.1	30.5	29.6	29.1	28.6	−4.3	+0.06
Switzerland	30.3	30.4	32.0	29.7	28.6	27.9	27.7	28.1	−2.3	−0.80
Sweden	29.5	30.7	30.9	29.4	28.9	29.7	27.7	28.2†	−2.5	−1.42
Greece	26.6	30.1	30.0	24.3	21.1	27.8	....	....	−2.3	−0.05
Massachusetts	25.7	28.3	25.3	24.8	25.4	25.4	26.2	27.8	−0.5	−0.15
France	24.4	26.2	25.5	24.7	24.9	24.1	23.1	22.5	−3.7	−0.71
Ireland	24.2	26.7	26.4	24.6	23.5	23.2	22.7	22.5	−4.2	+0.02
Rhode Island	23.5	24.8	22.6	22.1	23.6	23.5	23.6	24.2	−0.6	−0.64
Connecticut	21.7	24.7	22.3	21.7	23.5	22.3	22.6	24.7	....	−0.39

NOTE.— Figures for the New England states are not quite exact, but they differ so little from the correct figures that I have not changed them. * 1890. † 1891.

For the sake of comparison, I have formed a table of the average birth rate since 1874 for each country, and the annual birth rate for every third year since that time. See Table I, page 107.

The figures in the last two columns show the approximate decrease or increase between the birth and marriage rates of the years 1892 and 1874. The birth rate has decreased in every country, except Servia and Norway, and here the increase is slight. But the marriage rate has also decreased, although not always in proportion to the birth rate. These exceptions deserve especial notice, for they are countries in which the birth rate per 1000 is greatest. Thus the decrease of the birth rate in Russia, Hungary, and Servia is counterbalanced by the equal or greater decrease of the marriage rate (note especially Servia). I cannot interpret these facts, but it is apparent that there is some connection between the degree of civilization and the decrease of the birth rate.

According to the speculations of Mr. Herbert Spencer, we should expect to find with a decreasing birth rate a corresponding decrease in the death rate. With this in view, the following table has been prepared from the international statistics in the *Report of the Registrar-General of England* for the year 1891: —

TABLE II.

Country.	Death Rates in Different Countries.								Comparison of the Decrease of Birth, Marriage, and Death Rates.		
	Average Annual Death Rate for 20 Years.	Death Rate in 1874.	Death Rate in 1877.	Death Rate in 1880.	Death Rate in 1883.	Death Rate in 1886.	Death Rate in 1889.	Death Rate in 1891.	Difference between Death Rates in 1874 and 1891.	Difference between Marriage Rates in 1874 and 1892.	Difference between Birth Rates in 1874 and 1892.
Hungary	33.7	35.4	36.3	37.1	32.1	31.6	29.8	32.3	−3.1	−2.12	−0.4
Austria	30.6	31.7	31.6	29.8	30.1	29.4	27.3	27.9	−3.8	−1.25	−1.3
Prussia	25.6	25.9	25.6	25.5	25.6	26.1	23.2	22.9	−3.0	−1.60	−3.5
Italy	28.6	30.3	28.3	30.8	27.5	28.7	25.6	26.2	−4.1	−0.13	−1.3
Germany	26.0	26.7	26.4	26.0	25.9	26.2	23.7	23.4	−3.3	−1.60	−4.4
Netherlands	22.6	22.7	22.2	23.5	21.8	21.8	20.1	20.7	−2.0	−1.21	−4.4
England and Wales	20.3	22.2	20.3	20.5	19.6	19.5	18.2	20.2	−2.0	−0.79	−5.5
Scotland	20.4	23.2	20.6	20.5	20.2	18.9	18.4	20.7	−2.5	−0.54	−4.8
Denmark	19.0	20.0	18.7	20.4	18.4	18.2	18.6	20.0	−0.0	−1.43	−1.4
Norway	16.9	18.2	16.9	15.9	17.1	16.1	17.4	17.5	−0.7	−1.07	+0.8
Belgium	21.4	20.5	21.1	22.3	20.8	21.1	19.1	21.0	+0.5	+0.06	−4.3
Switzerland	22.1	22.3	23.5	21.9	20.4	20.7	20.3	20.8	−1.1	−0.80	−2.3
Sweden	17.6	20.3	18.7	18.1	17.3	16.6	16.0	17.9	−4.3	−1.40	−2.5
Massachusetts	19.5	19.7	18.4	19.8	20.1	18.6	19.2	19.4	−0.3	−0.15	−0.5
France	22.8	21.4	21.6	22.8	22.2	22.5	20.5	22.6	+1.2	−0.71	−3.7
Ireland	18.0	17.3	17.5	19.8	19.2	17.8	17.4	18.4	+1.1	+0.02	−4.2
Rhode Island	17.3	16.3	17.2	17.5	19.1	18.8	19.0	18.6	+2.3	−0.64	−0.6

The report of the Registrar-General unfortunately gives only about one-half of the countries represented in the preceding table. But from the few that are given we see that the death rates are high wherever the birth rates are high, so that, with the single exception of Italy, 10 of the countries can be arranged in the same order as in the preceding table, as far down as Norway. The last three columns of Table II show this relation. The harmony shown by Denmark and Norway is particularly interesting. Here the decreased birth rate is balanced by the decreased marriage rate, while the death rate shows only slight variations.

In drawing conclusions from these facts it must be borne in mind that during the last 30 years sanitary improvements have been perhaps the chief direct factor in the reduction of the death rate. A country might have a birth rate, for example, in 1894, that is greater than the birth rate 30 years ago, while the death rate, by reason of modern sanitary methods, is lower than at the earlier period. Massachusetts seems to show such a phenomenon. The birth rate in 1891 (27.4) was much higher than the average birth rate for 19 years (25.7), while the death rate in 1891 (19.6) remained about the same as the average (19.5). This factor, therefore, tends to counteract the seeming natural law concerning birth and deaths.

An American upon glancing upon the above international statistics might well be struck with the poor representation of the United States. Of our 51 states and territories only three, Massachusetts, Rhode Island, and Connecticut, are represented. This is due to the lack of statistics, owing to our miserable registration laws. It is a great pleasure, therefore, to note any improvement in our various reports, such as that shown in the Registration Report of Michigan for the year 1892.* Michigan registration laws are not exhaustive, and the returns, therefore, are incomplete, making birth, marriage, and death rates too small in proportion to the population. The value of the report is in the editing, and in this respect it excels all other reports. It is comparative throughout, and therefore of value to the most casual reader, while the inaccuracies, due to incomplete registration, and leading to erroneous conclusions, are carefully indicated by the editor. The actual value of the statistics is questionable, the

**Twenty-Sixth Annual Report Relating to the Registry and Returns of Births, Marriages, and Deaths in Michigan for the Year 1892.*

rates being estimated at about 60 per cent of the probable truth; but the comparative rates for different age periods, for different diseases, etc., are carefully worked out and tabulated, and these furnish data for valuable demographical conclusions.

All recent contributions to vital statistics demonstrate that while the death rate is in general decreasing the birth rate is decreasing at a still greater rate. Dr. Fr. Probst shows this for the German Empire for the year 1892,* as compared with the year 1891 and the preceding 10 years. A tabular summary will doubtless give the best idea of this phenomenon. The figures give the proportion of the marriages, birth, and deaths per 1000 of the population.

Year.	Marriages.	Births.	Deaths.
1883	7.82	38.18	30.11
1884	7.89	38.68	29.35
1885	7.66	37.62	30.14
1886	7.81	37.97	29.41
1887	7.82	38.19	28.87
1888	7.92	37.89	29.23
1889	7.49	37.85	27.25
1890	7.55	36.65	29.37
1891	7.72	38.11	27.91
1892	7.79	36.15	28.76

The year 1892 is characterized by a small increase in marriages, a slight increase over the preceding year in deaths, and a considerable decrease in the number of births, the birth rate being smaller than in any other year of the decennium. Although the death rate was greater in 1892 than in the preceding year, the increase took place among adults rather than among children under 5 years of age. In 1891 there were 326,256 deaths of children under 5 years of age; in 1892 the number rose te 328,920, while the deaths of older persons, 347,059 in 1891, rose to 364,501 in 1892, a much greater proportional increase than for children. This increase took place chiefly among persons between 50 and 80 years of age, whereas for persons between the ages of 20 and 30 years there was a slight decrease in the number of deaths. It would be an interesting study to trace the causes of these phenomena, and to show their relations to the causes of death. Figures relating to the causes of death are, unfortunately, not given.

* *Die Bewegung der Bevölkerung im Solarjahre 1892.* Statistische Monatschrift. XX Jg. Jan. Heft.

Dr. H. Neumann,* in the *Jahrbucher für Nationalökonomie und Statistik*, 1894, devotes 50 pages to the consideration of the illegitimate children of Berlin. He discusses their social standing, their fate, and the social condition of the parents. He finds that the size of the city does not affect the immorality. Berlin occupies the seventh place in regard to the number of illegitimate births, while its population is the greatest of all of the cities compared.

The social condition of the fathers is difficult to get, but in all of the cities compared the greatest number of fathers were laborers, hand-workers, and tradesmen. The social position of mothers is more easily ascertained; more than half are in personal service as maids, cooks, etc. While the fathers are usually well-to-do, the mothers, as a rule, are originally innocent, but are forced into immorality by the pressure of want. There are very few illegitimate children born of professionally prostitute mothers.

The foundlings' home affords the most trustworthy statistics for illegitimates. Here the social condition of the mothers and their work are important factors. Those who are able to take care of their children seldom abandon them, but those who cannot take care of their offspring, notably nurses and servants, are obliged to leave them. Most abandoned children, furthermore, are left at the age of two months. This is partly explained by the above facts, for the mother would not be able to resume work for about four weeks.

The fate of the foundlings is of interest. Many die, in spite of all possible care, the death rate for all illegitimate children being about one and three-quarters more than the rate for legitimate children. Some leave the city, and others are legitimatized by the subsequent marriage of their parents. In these ways the number of illegitimate children is reduced by about 80 per cent during the first five years; after this time it is almost impossible to follow their history. Of the cases that are known, 25 per cent of males and 8 per cent of females were arrested for robbery before their 25th year. Only a small number became prostitutes.

Professor Joh. Karup and Dr. R. Gollmer,† in the *Jahrbücher für Nationalökomie und Statistik*, give an extensive paper on the mortality statistics of teachers in schools and colleges. Their main results can be summarized in the following table: —

* *Die unehelichen Kinder in Berlin und ihr Schutz.* Jahrb. f. Nationalök. u. Statistik, III Folge, Bd. 7, 4 Heft.

† *Die Mortalitatsverhaltnisse der Lehrer nach den Erfahrungen der Lebensversicherungsbank f. D. in Gotha.* Jahrb. f. Nationalök. u. Statistik, III Folge, Bd. 8, 2 Heft.

TABLE III.

Percentages of Deaths.		Elementary Teachers. Age Periods.			Gymnasium Teachers. Age Periods.			University Teachers. Age Period.	Medical Teachers. Age Period.
		21–45.	46–60.	61–90.	21–45.	46–60.	61–90.	26–90.	26–90.
Total Deaths. Per Cent.	Periods. %	6.48	15.92	60.91	5.74	15.42	60.10	19.71	24.00
	Total. %	17.51			16.87				
Infectious Diseases.	Periods. %	1.25	1.97	2.27	0.99	1.14	1.77	1.41	1.79
	Total. %	1.65			1.32				
Constitutional Diseases.	Periods. %	0.40	1.88	7.73	0.53	1.88	7.43	2.05	2.15
	Total. %	1.96			1.99				
Nervous Diseases.	Periods. %	0.41	1.72	10.31	0.84	2.90	12.31	3.58	6.09
	Total. %	2.28			3.20				
Pulmonary Diseases.	Periods. %	2.88	6.01	19.97	1.86	4.06	14.75	3.84	5.01
	Total. %	6.40			4.47				
Circulatory Diseases.	Periods. %	0.33	1.73	9.79	0.53	2.22	13.53	4.86	4.30
	Total. %	2.17			2.99				
Diseases of Digestive Organs.	Periods. %	0.68	1.24	5.77	0.47	1.31	4.66	....	....
	Total. %	1.61			1.36				
Urinary Diseases.	Periods. %	0.16	0.57	3.28	0.12	0.68	3.66	1.41	2.15
	Total. %	0.74			0.82				
Skin Diseases.	Periods. %	0.05	0.13	0.61	0.03	0.10	0.89	0.38	....
	Total. %	0.16			0.18				
Suicides.	Periods. %	0.12	0.29	0.09	0.15	0.34	0.11	0.26	0.36
	Total. %	0.19			0.21				
Accident.	Periods. %	0.12	0.24	0.92	0.15	0.10	0.67	0.51	0.36
	Total. %	0.27			0.21				
Diseases of Sexual Organs. %		....			....			....	...

N. B.— The figures are taken from insurance reports, and represent the percentages among insured teachers.

REVIEWS AND NOTICES.

THE DISTRIBUTION OF OUR URBAN POPULATION.

Few facts brought to light by our last federal census have caused more discussion than the growth of our urban population. According to that enumeration 26,109,074 persons, or 41.69 per cent of our total population, were living in towns and cities each of which contained 1000 or more inhabitants; 18,235,670 persons, comprising 29.12 per cent of the total number of inhabitants, were found in cities having each 8000 or more inhabitants. The per cent of urban population in cities of this size had increased during the century preceding from 3.35 per cent to 29.12 per cent of total population, but the most rapid increase was found to have taken place during the last decade, when the percentage of urban population rose from 22.57 to 29.12.

What effect this increase of city dwellers will have upon our political, economic, and social life we shall here not attempt to ascertain, but an analysis of the distribution of the urban population of some of our states having different industrial conditions may be helpful to those who are inclined to speculate on such matters. Census Bulletin No. 165 gives us some such analysis, but does not give the percentages, and does not, of course, make any attempt to contrast the urban population of states of different sections, as we do here. A change in the grouping of cities in conformance with the European practice of making one group of towns comprise those having from 2000 to 4000 inhabitants, instead of those having from 2500 to 4000 persons, as is done by our censuses, is made. Another division is also made, placing in a separate group those cities containing 100,000 or more inhabitants. Two groups of states are presented in the following tables, one state in each group being from the North Atlantic division, another from the North Central division east of the Mississippi, and the third from the same division west of the Mississippi. States in the Western division and in the South have too few cities for purposes of comparison. Of the North Atlantic division, the New England states are

excluded, because census returns fail to distinguish between towns (townships) and the villages situated within the towns.

None of the states in the first group presented contain very large cities. New Jersey, however, is primarily a manufacturing and commercial state, with nearly two-thirds of her population living in the towns and cities classified. Indiana possesses a considerable number of manufacturing towns, and has also mining interests of importance, yet nearly 68 per cent of her people are found outside of the towns having 1000 and more inhabitants, and are doubtless engaged in agriculture. Kansas has a still more distinct agricultural character, only 26.54 per cent, or little more than one-fourth, of her inhabitants living in her 101 towns of the size classified. See Table I, page 115.

It will be seen from Table I that the percentage of urban population in the smaller cities and towns in New Jersey is not only less than the percentage in the larger cities, but that it is smaller than the percentage in cities of the same size in the western states. Cities of less than 8000 inhabitants contain only 16.30 per cent of the total urban population in New Jersey, while cities of the same size contain 43.11 per cent of the urban population of Indiana, and 56.18 per cent of the urban population of Kansas.

In the next class, cities containing from 8000 to 25,000 inhabitants, New Jersey has a larger per cent of total population, but a considerably smaller percentage of total *urban* population than either Indiana or Kansas. Beyond this point, however, New Jersey's superiority is well established, whether the comparison be for total population or for total urban population.

In the second group of states considered, all the states, New York, Illinois, and Missouri, have within their borders large cities whose growth has been largely the result of their location with respect to the channels of commerce. As each of these cities is a commercial centre for a large region of territory, it does not necessarily show anything about the industrial character of the state. New York, as everyone knows, is primarily a manufacturing and commercial state, although nearly two millions of her inhabitants, 31.21 per cent of her total population, are found outside the cities and towns classified in the table. Illinois has nearly one-half of her population engaged in agricultural pursuits, while Missouri, in spite of the presence of two large cities within her borders, has a rural population including nearly two-thirds of her inhabitants.

TABLE I. DISTRIBUTION OF URBAN POPULATION IN NEW JERSEY, INDIANA, AND KANSAS.

	Population.			Percentage of Total Population.			Number of Cities.			Average Size of Cities.			Percentage of Total Urban Population.		
	New Jersey.	Indiana.	Kansas.	New Jersey.	Indiana.	Kansas.	New Jersey.	Indiana.	Kansas.	New Jersey.	Indiana.	Kansas.	New Jersey.	Indiana.	Kansas.
State	1,444,933	2,192,104	1,427,096	100.00	100.00	100.00	....	....	....	.....	.....	.....	... ..	.....	.....
Rural population	511,927	1,488,173	1,048,405	35.42	67.88	73.46	....	....	....	.....	.....	.....	.....	.....	.....
Urban "	933,006	704,231	378,691	64.58	32.12	26.54	77	136	101	12,116	5,178	3,749	100.00	100.00	100.00
Cities of 1,000–2,000	42,884	97,450	68,835	2.96	4.44	4.82	29	64	49	1,478	1,557	1,329	4.60	13.83	18.17
" " 2,000–4,000	52,677	99,648	86,182	3.64	4.54	6.04	18	35	33	2,926	2,847	2,490	5.64	14.15	22.75
" " 4,000–8,000	56,533	106,567	57,795	3.91	4.85	4.05	10	19	10	5,653	5,608	5,779	6.06	15.13	15.26
" " 8,000–25,000	160,549	178,764	96,556	11.11	8.15	6.76	13	14	7	12,350	12,769	13,794	17.13	25.38	25.50
" " 25,000–100,000	275,530	116,366	69,323	19.06	5.30	4.86	5	3	2	55,106	38,789	34,661	29.53	16.50	18.30
" " 100,000 or over	344,833	105,436	.....	23.86	4.81	....	2	1	....	172,416	105,436	.....	36.96	14.96	.....

TABLE II. DISTRIBUTION OF URBAN POPULATION IN NEW YORK, ILLINOIS, AND MISSOURI.

	Population.			Percentage of Total Population.			Number of Cities.			Average Size of Cities.			Percentage of Total Urban Population.		
	New York.	Illinois.	Missouri.	New York.	Illinois.	Missouri.	New York.	Illinois.	Missouri.	New York.	Illinois.	Missouri.	New York.	Illinois.	Missouri.
State	5,997,853	3,826,351	2,679,184	100.00	100.00	100.00	....	....	....	.....	.....	.....	.....	.....	.....
Rural population	1,872,051	1,867,403	1,697,315	31.21	48.81	63.31	....	....	....	.....	.....	.....	.....	.....	.....
Urban "	4,125,782	1,958,948	981,869	68.79	51.19	36.69	255	241	126	16,179	8,128	7,792	100.00	100.00	100.00
Cities of 1,000–2,000	156,720	187,612	94,675	2.61	4.90	3.53	111	134	69	1,412	1,400	1,372	3.79	9.57	9.64
" " 2,000–4,000	163,585	164,868	75,626	2.72	4.31	2.82	60	60	28	2,726	2,747	2,701	3.96	8.41	7.70
" " 4,000–8,000	205,600	119,513	107,825	3.42	3.12	4.02	38	23	21	5,410	5,196	5,134	4.98	6.10	10.98
" " 8,000–25,000	446,349	315,587	66,933	7.46	8.24	2.49	33	21	5	13,526	15,028	13,387	10.81	16.11	6.81
" " 25,000–100,000	442,324	72,518	52,324	7.37	1.89	1.95	9	2	1	49,147	36,259	52,324	10.72	3.70	5.32
" " 100,000 or over	2,711,204	1,099,850	584,486	45.20	28.74	21.81	4	1	2	677,801	1,099,850	292,243	65.71	56.14	59.53

Here, again, the western states show a larger percentage of people living in the smaller towns and cities than is found in New York, but Missouri does not show the same superiority over Illinois.

Throughout the column the relations of the percentages of urban population in each class of cities in Illinois to the percentages of the same class in Missouri do not present any regularity of increase or decrease. In all of these states the percentage of either total population or of urban population living in the smaller cities is, compared to the states of the preceding group, a very small one. It is when we come to the last class, cities containing over 100,000 inhabitants, that we find the explanation of the great urban population of these states. In all of these states we find over one-half the total urban population living in the cities of this class, and in New York almost one-half the entire population lives in her four great cities.

It may be objected to the above comparison that towns of 1000 to 2000 are too small to be included among cities presenting urban characteristics. It is doubtless true that in the eastern states many of these country towns built along the highway are only villages whose inhabitants are engaged in agricultural occupations, and do not, strictly speaking, present urban characteristics. But this is seldom the case with western towns of this size. They are not only the market towns of the surrounding community, but often factory life on a small scale exists here, and not infrequently these towns are the county seats, and the business interests and social life are considerably different from those of the agricultural communities.

MATTHEW BROWN HAMMOND.

FOREIGN PARENTAGE AND FOREIGN BORN.

On page lxxxix of the Introduction to Part I of the *Compendium of the Eleventh Census* it is stated that "the distribution of native white persons of foreign parentage follows very closely that of the foreign-born element, showing that those states and regions of the country which a generation ago attracted European immigrants still continue to attract them in practically the same degree."

Do the statistics actually show this? In the accompanying tables the statistics on this point are given. They are for the three census divisions of the states in which there is the largest foreign element.

For each state the total foreign-born population and total native born (whites) of foreign parentage are given, and the percentage of each of these to the total population of the state. These figures are to be found in Part I of the *Compendium*, page lxxxviii of the Introduction, and on page 469. Finally, the percentage of the number of native born of foreign parentage to the number of foreign born for each state has been calculated, which gives the proportion between the two.

Now, if it is true that "the distribution of the native white persons of foreign parentage follows very closely that of the foreign-born element," this proportion should remain approximately constant in the different states. But it is far from doing so. In the North Atlantic Division the percentage varies from 69.13 in New Hampshire to 141.02 in Vermont. In the North Central Division it varies from 77.77 in North Dakota to 207.04 in Indiana, while in the Western Division it runs from 71.84 in Montana to 160.81 in Utah.

Further, these figures show not only wide variations in the proportion, but also an excess in some states of native born of foreign parentage over the foreign born, while in others an excess of the foreign born appears. Thus, in the North Atlantic Division four states, Maine, New Hampshire, Massachusetts, and Rhode Island, show an excess of the foreign born; while five states, Vermont, Connecticut, New York, New Jersey, and Pennsylvania, show an excess of native born of foreign parentage. Similarly, the Western Division as a whole shows an excess of foreign born, while the other two divisions show an excess of native born of foreign parentage.

The above facts indicate that the proportion between the two elements of the population in question, instead of being approximately constant in the different states, exhibits great variation, and, hence, that the statement of the census, that "the distribution of the native white persons of foreign parentage follows closely that of the foreign-born element," is not correct. (For table see next page.)

L. W. Hatch.

NORTH ATLANTIC DIVISION.

States and Territories.	Total Foreign Population.	Total Native White Population of Foreign Parentage.	Percentage of Foreign Population to Total Population.	Percentage of Native Whites of Foreign Parentage.	Percentage of Native Whites of Foreign Parentage to Foreign Born.
Maine	78,961	73,865	11.94	11.17	93.55
New Hampshire	72,340	50,015	19.21	13.28	69.13
Vermont	44,088	62,149	13.26	18.70	141.02
Massachusetts	657,137	606,440	29.35	27.09	92.29
Rhode Island	106,305	94,282	30.77	27.29	88.69
Connecticut	183,601	193,048	24.60	25.87	105.16
New York	1,571,050	1,837,453	26.19	30.64	116.99
New Jersey	328,975	371,878	22.77	25.74	113.04
Pennsylvania	845,720	1,066,580	16.08	20.28	126.11
Total	3,888,177	4,355,710	22.34	25.03	112.04

NORTH CENTRAL DIVISION.

Ohio	459,293	791,735	12.51	21.56	172.34
Indiana	146,205	302,735	6.67	13.81	207.04
Illinois	842,347	1,044,804	22.01	27.31	124.07
Michigan	543,880	613,590	25.97	29.30	112.82
Wisconsin	519,199	726,835	30.78	43.09	139.99
Minnesota	467,356	518,151	35.90	39.80	110.86
Iowa	324,069	513,187	16.95	26.84	158.34
Missouri	234,869	437,699	8.77	16.34	186.31
North Dakota	81,461	63,347	44.58	34.67	77.77
South Dakota	91,055	109,215	27.69	33.22	119.97
Nebraska	202,542	250,420	19.13	23.65	123.62
Kansas	147,838	236,597	10.36	16.58	160.03
Total	4,060,114	5,608,315	18.16	25.08	138.10

WESTERN DIVISION.

Montana	43,096	30,959	32.61	23.43	71.84
Wyoming	14,913	14,520	24.57	23.92	97.35
Colorado	83,990	79,814	20.38	19.36	94.99
New Mexico	11,259	12,539	7.33	8.16	111.32
Arizona	18,795	14,027	31.52	23.53	77.82
Utah	53,064	85,314	25.52	41.04	160.81
Nevada	14,706	12,406	32.14	27.11	84.34
Idaho	17,456	21,154	20.69	25.07	121.16
Washington	90,005	68,757	25.76	19.68	76.39
Oregon	57,317	49,967	18.27	15.92	87.13
California	366,309	320,390	30.32	26.52	87.46
Total	770,910	709,847	25.46	23.45	92.10

A PROPOSED SUMMARY OF THE VITAL STATISTICS OF NEW ENGLAND.

The registration of the statistics of marriages, births, and deaths has been conducted for a greater length of time and with greater uniformity of methods in the New England states than in any other portion of the Union. Beginning with a simple statute in 1639 in the Massachusetts Colony, requiring a record of every marriage, birth, and death, there has been an increasing recognition of the necessity of better and more uniform legislation from that time to the present. No reports were made upon the subject until the publication of the first Registration Report of Massachusetts for the year 1842. This was followed by reports from the remaining states as follows: Rhode Island beginning with 1853; Vermont, 1857; Connecticut, 1874; New Hampshire, 1880; and, finally, by the first report of Maine, recently issued, for the year 1892.

In consequence of the publication of this first report of the vital statistics of Maine, it will now be possible to issue a combined summary of the essential data contained in these six reports. For this purpose the secretaries of the Boards of Health of the six New England states formed a simple federation at Montreal, at the meeting of the American Public Health Association, in September, 1894, and decided to publish shortly a combined digest or summary of the Vital Statistics of the New England States. The first issue will contain the summary of statistics for 1892, after which others will probably be published at intervals of about five years; the second to contain the statistics for 1895. The subjects to be presented will be a statement of the population, rate of growth, density, distribution by sexes, and estimates for intercensal years since 1880; marriages by ages, nativity, months, and marriage rates; births by sexes, months, parentage, still births, plurality, illegitimacy, and birth rates; deaths by ages, months, sex, nativity, principal causes, and death rates.

There will be in addition a summary of the vital statistics of each city and town of more than 10,000 population, including the marriages, births, deaths, and principal causes of death in each.

The objects to be secured by such a publication are two-fold. First, the publication of the results obtained in each state in connection with those of five other states will tend to secure greater uniformity in methods of presentation of the different data, together with a more

perfect and complete collection of the facts essential to registration; second, it is hoped that such a summary may prove a stimulus to the introduction of registration in states where no registration exists, and to its improvement where the laws are very loosely enforced.

STATISTICS OF INFECTIOUS DISEASES.

Statistik der Infectiosen Erkrankungen in den Jahren 1881–91, und Untersuchung der Einflusses der Witterung. By Josef Körösi, Director des Communal-statistischen Bureaus, Budapest. Berlin, 1894. Puttkammer und Mühlbrecht.

Statistics relating to mortality are obtainable at the present day from almost all civilized nations, but those which relate to morbidity or sickness are much more rare. Almost the only statistics of this character collected in the United States are those of the State Board of Health of Michigan, compiled by Dr. Baker, the Secretary of the Board. The adoption of laws, however, in other states and countries, requiring notification of infectious diseases, will undoubtedly secure better results in the future in this direction.

The pamphlet before us contains in its 141 pages a fund of information carefully compiled by the well-known statistician, Körösi. The work is divided into two parts, Epidemiological and Climatological. The means of information are the official notifications of certain diseases, covering a period of 10½ years, from July 5, 1881, to December 31, 1891. The diseases under observation were croup, diphtheria, measles, scarlet fever, small-pox, typhoid fever, and cholera.

In addition to the statistics of prevalence of these diseases, one brief chapter treats of the influence of unfiltered water on the spread of typhoid fever, and another upon the enforcement of vaccination, a topic which Körösi had previously made the subject of several valuable papers. Another chapter is devoted to international statistics of infectious diseases.

Another valuable chapter treats of the influence of Preventive Regulations upon the Improvement of Sanitary Conditions. Taking two nearly equal periods, 1872–80 and 1881–91, there is a decided improvement in Budapest, vigorous prophylactic regulations having been inaugurated in 1881. The mortality from infectious diseases

per 10,000 of the population in the former period was 56.60, and in the latter 30.58. In the case of measles the author finds that school attendance has a marked influence in its spread, the figures being, for the vacation quarter, August–October, 3054. and for the other quarters, November–January, 11,865; February–April, 13,253; May–July, 13,147.

In that portion of the book which relates to the influence of the weather he adopts a series of five grades of temperature and four of air moisture, and discusses the influence of these conditions separately and in combination. The grades are as follows: —

Temperature, C.	Degrees of Moisture.
Below 0	Below 50
0–5	50–60
5–14	60–80
14–18	Above 80
Above 18	

None of his conclusions in this portion of the book give evidence of a very decided influence of those two conditions upon the prevalence of the diseases specified, and in the case of measles he finds that school attendance far outweighs any meteorological conditions in its influence. A very full set of statistical tables accompanies the text arranged by days, periods of five days, weeks, and months; containing observations upon barometric pressure, temperature, moisture, prevailing winds, and reported cases of disease for each day, week, and month. S. W. A.

MORTALITY IN AUSTRALIA.

Tropical Mortality. By Richard Teece, F.I.A., F.F.A., Actuary of the Australian Mutual Provident Society.

This is an interesting study of an antipodean insurance society's experience in the colony of Queensland, Australia, covering a period of thirteen years from 1875 to 1888. The Colony, as Mr. Teece says, "extends from about 29° S. to about 10½° S.," and "lies largely within the torrid zone." Consequently, this experience is of peculiar value. It covers 14,735 policies and 12,780 lives; 1089 policies were already in existence when the term began. The experience showed a mortality greater by 16.1 per cent than would have been expected, according to the Society's general experience, during the same period;

this on the basis of the true age, about one-third of the lives being rated at higher ages. The mortality was, however, 17 per cent lower than would have been expected according to the HM Table. Calculating at the assumed ages, the mortality was 15.9 higher than would be expected according to the Society's general experience, and 22.8 per cent lower than would be expected according to the HM Table.

The lives which were accepted at actual ages show a mortality 20.7 per cent higher than would be expected according to the Society's general experience, and 22.9 per cent lower than according to the HM Table. The lives which were rated up are, taken at the true ages even, more favorable in proportion to the lives rated up in the general experience of the Society. The mortality experienced was 11.6 per cent higher than according to the general experience, rated-up lives taken at actual ages, and 10.8 per cent higher than the general experience, rated-up lives, at the assumed ages. As compared to the deaths expected according to the HM Table, the actual mortality was 9.1 per cent and 12.7 per cent lower, respectively.

Mr. Teece makes a number of comments upon this showing, all of them pertinent and interesting. The most suggestive and important is the following: —

"Had the impaired lives only been all taken at their true ages the rate of mortality would still have been about 9 per cent less than that shown by the HM experience. In my General Report on the Mortality Experience of the Society, p. 45, I said: 'The HM Table shows a decidedly high rate of mortality, and I do not think that the death rate in any prudently conducted office receiving a large yearly accession of new business should, during the first fifty years of its existence, equal that shown by the HM Table.' With this experience before me I am inclined to go further, and say that the HM Table cannot be relied on in these days by any office as a standard by which to measure the expected death claims."

A continuation of statistical research of this careful and painstaking character will soon enable actuaries to construct mortality tables suitable to differences of locality and of occupation. Meanwhile, it is agreeable to note that the deficiences of the HM Table have not escaped the notice of the Institute of Actuaries which framed it. The Institute and the Scottish faculty are even now engaged in getting together material for the construction of a new one.

MILES MENANDER DAWSON.

LABOR STATISTICS.

Third Annual Report of the Bureau of Industrial Statistics of Maryland. 1895. A. B. Howard, Jr., Chief. Pp. 196.

The topics of special interest dealt with in this report are mortgages, personal property values; sweat shops, the unemployed, and strikes. The report on the sweat shops is based upon personal visits of inspection to 200 shops in which clothing is manufactured. Descriptive accounts are given of the various establishments. A large portion of the part devoted to the unemployed is abstracted from the recent English Blue-Book upon the subject.

Eighth Annual Report of the Bureau of Industry and Labor Statistics for Maine. August, 1895. Pp. 219.

The special inquiry of the Bureau during the past year was directed to ascertain to what extent the business depression had affected the laboring population of the state. 224 returns, representing 35,315 hands, were returned. "The number of our working classes who have been thrown out of all employment has been comparatively small, and actual suffering of rare occurrence." Blanks were also sent to numerous retail dealers throughout the state. These returns are used to determine the cost of living in 1893 and 1894. There are also reports in regard to the number of factories, mills, and shops built during the year. The report of the factory inspector, with several illustrations, is included.

Annual Report of the Secretary of Internal Affairs of the Commonwealth of Pennsylvania. Part III. Industrial Statistics, Vol. XXI. 1893. Harrisburg, 1894.

The larger portion (pp. 515) of this report is devoted to the statistics of building and loan associations. It includes the data which have been published by the Department of Labor at Washington, and, in addition, a record of 160 other associations, most of which are new. The total number, therefore, reported upon is 1239. The assets of these associations are $103,943,364. The cash income for one year was $44,432,686; the matured shares and withdrawals for one year, $12,933,970; the average salaries per association were $264.94; the total membership is 272,580; the total number of borrowers is 81,658.

It is estimated that since the first association was organized that

$100,000,000 have been returned to the members in cash and in satisfactory mortgages, making a grand total, including the present assets, of $203,943,364, a sum twice as great as the capital of the national bonds of the state. It is said that building society people own the whole or part of 150,000 homes in Pennsylvania. Seventy-five thousand women hold stock valued at $30,000,000.

An interesting table is a classified list of occupations of share-holders in 245 associations. The total of laborers represent 23.46 per cent; housewives and housekeepers, 20.86 per cent; artisans and mechanics, 13.88 per cent; merchants and tailors, 10.93 per cent; mill and factory employes, 9.47 per cent.

The Second Part is devoted to the subject of the sweating system in Philadelphia. At the time of making this investigation there were 273 sweat shops known to be in operation in Philadelphia. There were 1806 persons employed in the places visited. Of this number 989 were men; 755, women; 40, boys under 16; and 22, girls under 16. Out of 273 employers 119 were of Russian nativity; 76, German; 22, Poles; 15, Americans. Out of 1806 employes 915, or one-half, were Russians; 469, Americans; 168, Germans; 98, Poles. A large amount of detail information is given with regard to the condition of various shops.

A Third Part is devoted to strikes during the year 1893. There were 53 strikes during the year against 26 in 1892. The strike on the Lehigh Valley Railroad is reported at length. The estimated loss in wages incurred by the striking employes was $1,395,423; the loss of the employers is estimated at $131,650. The number engaged in the strikes was 9501.

Sixth Biennial Report of the Commissioner of Labor, Wisconsin, 1893–94. J. Dobbs, Commissioner. Madison, 1894. Pp. 119, 221.

This report is devoted particularly to the building trades, statistics of manufactures, and a synoptical report of factory inspection. In the part devoted to building trades there is considerable material bearing upon the question of apprenticeship, answers to the following questions addressed to manufacturers being tabulated: —

a. How many of your workmen commenced as apprentices with you?

b. How many apprentices have you employed in 1893?

c. Have you any system or rule of promotion of apprentices?

d. If so, what are their earnings during the first year; second; third; fourth?

e. Is it true that the best workmen of the building trades are those who served as apprentices in Europe?

f. Do you experience any trouble in procuring first class workmen?

The answers to the last are almost invariably to the effect that there is no difficulty. The total number of accidents reported by the factory inspectors during 1893–94 was 309, of which 44 were fatal.

Ninth Annual Report of the Commissioner of Labor, 1893: Building and Loan Associations. Washington, 1894. Pp. 719.

In this investigation the term "building and loan association" was used in a general sense. It thus includes coöperative banks, homestead aid associations, etc. Such associations have existed in this country since about 1840. The number of associations considered is 5838, of which 240 are national; the total share-holders in the associations reporting, 1,745,725; the total dues and profits are reported at $450,667,594; the average size of loans was $1120; the homesteads acquired in the associations were 314,755. All these statistics refer to the fiscal year ending nearest to January 1, 1893. Besides the general tables, which cover some 300 pages, there are special tables and chapters devoted to the subject of premium plans, plans of distribution of profits, withdrawal plans, and legislation relating to the subject. The laws of all the states of the Union relating to this subject are abstracted.

Seventh Annual Report of the Commissioner of Industrial Statistics of Rhode Island. 1884. Providence. Pp. xii, 337.

The first chapter is devoted to factory industry in the textile industries; the second to labor organizations; the third to employes' returns; the fourth to retail prices of food, fuel, etc.; and the fifth to statistics of manufactures.

Second Annual Report of the Bureau of Industrial Statistics of Maryland. A. B. Howard, Jr., Chief. 1894. Annapolis. Pp. 387.

The topics particularly discussed are agriculture, immigration, taxation and assessment, public roads, employment agencies, and the oyster industry. The part on taxation and assessment is a somewhat elaborate discussion of the present state law and the Senate bill of 1892.

Statistics of Coal in Illinois. Twelfth Annual Report. A Supplementary Report of the State Bureau of Labor Statistics, containing the 10th Annual Report of the State Inspectors of Mines. George A. Schilling. Springfield, 1894. Pp. lxxix, 162.

There has been a marked decrease in the number of mining places in Illinois during the past four years. In 1890 there were 936 mines; in 1893 but 788. Nevertheless, the output of coal in 1893 was four and a half million tons greater than in 1890. Mining coal by machinery is steadily increasing. The number of machines reported in 1893 is 310 against 241 in 1891. A larger number of men have been killed than in any year but one. The number of fatal casualties reported is 69; that is, while the tonnage of the year has increased 12 per cent, and the number employed 5 per cent, the fatal casualties have increased 21 per cent. The number of men employed to one man killed is 513. The number of tons mined to one life lost is 289,124. The number of individual accidents during the past year was 403, the accidents being those reported which have caused lost time to the workmen of a week or more. The following table shows the number of tons mined to each life lost in various states and Great Britain, compiled by this bureau: —

States.	Year 1891.	Year 1892.	Year 1893.
Illinois	1 to 261,012	1 to 313,372	1 to 289,124
Pennsylvania —			
Anthracite	1 to 103,553	1 to 109,422	No report.
Bituminous	1 to 151,653	1 to 347,586	" "
Ohio	1 to 296,595	1 to 346,426	" "
West Virginia	1 to 202,262	1 to 222,216	" "
Iowa	No report.	1 to 183,976	1 to 148,867
Missouri	" "	1 to 150,864	No report.
Kentucky	1 to 184,321	1 to 263,619	" "
Kansas	1 to 189,129	No report.	" "
Great Britain	1 to 189,457	1 to 185,119	" "

It is found that nearly 70 per cent of the whole number killed were miners; that one-half were married men, and all left dependents, the total number of dependents being 138. The average age of the married men was about 38 years, and of the single men 28 years. There is a large and interesting amount of statistics in regard to wages.

Sixteenth Annual Report of the Bureau of Statistics of Labor and Industry of New Jersey for the Year Ending October 31, 1893. Trenton, 1894. Pp. iv, 490.

The principal parts of this report are devoted to the subject of women's work and wages, pp. 79–141, and to coöperative building and loan associations, pp. 143–473. The tables on women's work and wages are summarized from returns from 3877 women and girls, comprising wage earners engaged in 80 general industries, with 400 specific occupations or trade subdivisions. Eighty-two per cent of the women reporting were born in the United States. The average age of these particular workers is but 21.8 years. The average of the ages when these women began to work is 14.9. The average daily hours of work is 10½. Nearly all of them are paid weekly wage rates, the average of which in full time is $5.50. The classified rates will, however, better indicate the general wages received than the average: —

Under $3.00, ...	219	Between $6.00 and $7.00, .	804
Between $3.00 and $4.00, .	381	" 7.00 " 8.00, .	373
" 4.00 " 5.00, .	745	" 8.00 " 10.00, .	449
" 5.00 " 6.00, .	752	$10.00 and over, ...	154

The average number of days lost, exclusive of Sundays and holidays, was 58.

Seventh Annual Report of the Board of Mediation and Arbitration of the State of New York. January 22, 1894. Albany. Pp. 334.

In the year ending Oct. 31, 1893, there were fewer strikes and lockouts in New York than for several years, but the work of the Board of Arbitration is being more and more recognized. A statement is given of the most important labor disputes during the fiscal year.

Jahrsbericht Deutsche Erwerbs-und Wirthschaftsgenossenschaften. By D. F. Schenck. Leipzig.

On May 31, 1893, there were in Germany 9934 coöperative societies, as compared with 8921 in 1892. The largest increase has been in credit associations, from 4791 to 5489. These refer particularly to the *Raiffeisen* agricultural banks. Supply associations increased from 1283 to 1339, and building associations from 77 to 101.

Sixteenth Annual Report of the Bureau of Labor Statistics and Inspection of Missouri for the Year Ending November 5, 1894. Jefferson City. Pp. 531.

The special topics dealt with in this report are statistics of manufactures, pp. 62–210; factory inspection, pp. 211–245; crimes and costs, 246–370; building and loan associations, 371–508; strikes.

Tenth Annual Report of the Bureau of Labor Statistics, Connecticut, for the Year Ending November 30, 1894. Hartford. Pp. 398.

The report is divided into two parts, the first of which is devoted to savings and loan associations, and the second to effects of the industrial depression, child labor, effect of reduced working time on production, and industrial education. The inquiry with regard to industrial depression covers the 15 months from June 1, 1893, to August 31, 1894. It is estimated that the industrial establishments were in operation about two-thirds of full time, employing about 85 per cent of the average number employed in 1892, paying wages monthly about 75 per cent of the monthly average of 1892, and producing about 75 per cent of the normal out-put. Reports were received from 378 establishments.

CHARITIES AND CORRECTIONS.

The Sixty-Fifth Annual Report of the Inspectors of the Penitentiary for the Eastern District of Pennsylvania. Philadelphia, 1894. Pp. 178.

Of all the published prison reports of the United States this is one of the most interesting and, from a sociological point of view, valuable. Of the 658 convicts received during 1894 it is reported that 92 had never attended any school; 510 were entirely ignorant of the knowledge of any trade. Of the total number received 26 were on their third conviction to this particular penitentiary; 14 received their fourth sentence, and 7 their fifth sentence. The prison authorities assign the cause of nearly all these cases to inherent depravity. One convict was received serving his sixth conviction, each of which was for counterfeiting, his ages on the several convictions being 23, 40, 51, 54, 56, and 60.

The criminal history is given of 138 persons received during the year 1894 who had served one or more terms previous in the Eastern Penitentiary. The history of these cases is given in detail, and covers some 40 pages. There is a statement as to 63 prisoners sent to the Penitentiary in 1894 who also had relatives in prison. The

following is a typical case, and illustrates the method of cataloguing these cases: —

HHH (A 7843), twenty-five years of age, was convicted December 15, 1894, of horse stealing, and sentenced to four years and six months. He had previously served terms in Lebanon County Prison, the Huntingdon Reformatory, and here (A 6626) one year and nine months for receiving stolen goods. Two brothers of this man have served terms here as follows: One (A 6566) now here under a sentence of two years and three months for burglary, larceny, and receiving stolen goods; and the other, after having served three terms (A 2226, larceny; A 3921, aggravated assault and battery; A 5911, assault with intent to rob), was discharged September 12, 1894, and the same day killed his wife, and is now awaiting execution, having been convicted of murder in the first degree. This brother had also served a term in Lebanon County Prison; at his first sentence here he was 17 years of age, and is now 34. All are natives of Lebanon County; all had attended school and were unapprenticed.

Fifth Report of the Board of State Charities of Indiana for the Year Ending October 31, 1894. Indianapolis, 1894. Pp. 104. Part 2. *Proceedings of the Third Annual State Conference of Charities.* Pp. 62.

Indiana has 3200 dependent children in institutions, including orphans' homes and poor asylums. The cost of maintaining these last year was about $325,000. The average length of time which the children remain in these institutions is from four to five years. It is recommended that a state school be established for dependent children, by means of which the children should be placed out at an earlier age. One chapter is devoted to the custodial care of feeble-minded women. "Incomplete records from 39 Indiana counties show that 57 feeble-minded women, who are, or recently have been, inmates of the poor asylums in these counties, have been the mothers of 95 illegitimate children. There is no doubt that, could the complete records be secured, the number of both women and children would be greatly increased." Indiana makes no special provision for the care of epileptics. In the pauper institutions and hospitals 606 epileptics are found.

During the winter of 1893–94, the time of the depression, the poor asylum population did not increase as much as was expected. The total increase in cost was only $7000, but the expenditure by township trustees for poor relief increased about $75,000. The largest class of paupers in the poor asylums is the feebled-minded and the

idiotic, about one-fourth of all the inmates; the "feeble-senile" is second, forming about one-sixth of the population. Much complaint is made of the abuse of out-door relief.

Semi-Centennial of the New York Association for Improving the Condition of the Poor. October, 1894. Pp. 275.

This volume contains the 50th and 51st annual reports, and, in addition, has a review of the relief work performed during the past 50 years. Since 1843 the Association has expended for the poor $2,238,168. There are department reports on Temporary Relief, Dwellings, Food Supply, Hygiene, etc.

The 19th Annual Session of the Directors of the Poor of Pennsylvania, held at Williamsport, October 17–19, 1893. Pittsburg, 1894. Pp. 201.

In addition to papers on general questions of relief and treatment of the dependent classes there are some 25 pages containing statistics of the different counties, in regard to the number of inmates, cost of care, and expense of administration. The subjects of the papers are as follows: State Asylum for Chronic Insane; Separate Asylum for Epileptics; Poor law Revision; Reformatory Work; Past, Present, and Future of our Charitable Institutions.

Twelfth Biennial Report of the Michigan State Board of Corrections and Charities, 1893–94. Lansing, 1895. Pp. 263.

In addition to the usual amount of descriptive information with regard to the institutions there are statistical tables with regard to the prisons, reformatories, and state charitable institutions.

Twenty-Sixth Annual Report of the Board of State Charities and Corrections of Rhode Island. 1895. Pp. 164.

STATISTICAL YEAR-BOOKS AND ALMANACS.

The Statesman's Year-Book, 1895. Edited by J. Scott Keltie. Thirty-second Annual Publication. London, 1895. Pp. xxxi, 1156.

It is stated that "a special feature of the present issue is the information appended to the commercial statistics of various countries with their system of customs valuation." The introductory tables relate to the value of silver, wheat crops of the world, the navies of the world, shipping, European railways, and the British Empire.

The Statistical Year-Book of Canada for 1893. Department of Agriculture. Ottawa, 1894.

The Year-Book for 1893 has been remodelled and new features added. It is divided into two parts: (1) Record, (2) Abstract.

The Record contains historical matter; the constitution and government of the country; results of the census of 1891; statements of the managers of banking institutions; short presentations of important events of the year, such as the Behring Sea Settlement, the French Treaty, and concise biographical notices of public men of Canada who have died during the year. It also contains a chapter on the forests of Canada, and an account of Newfoundland,— the "first of a series on countries with which Canada does business."

The Abstract is a digest of the Blue-Books issued by the several departments, with such explanations as seemed necessary. The analysis of imports in the chapter on Trade and Commerce has been made on a different basis from that adopted in former year-books, the object being to supply material for comparisons of trade and customs taxes with those of Great Britain and the United States.

The Financial Reform Almanac, 1895. Thirty-first issue. London. Pp. 296.

This issue is in a new and handier form, similar to that of the almanacs published in the United States. Considerable space is given to the recent United States tariff. More detailed articles are on the subjects of Mining Royalties, Population Statistics of 1891, Local Taxation, Assessment of Taxes, National and Local Expenditure, and Elementary Education.

Album de Statistique Graphique de 1893. Ministry of Public Works. Paris, 1894. Pp. xviii. Plates, 21.

This is the 14th issue of the Album. Of the 21 plates nine belong to a continued series, and 12 are new. Interesting statistics are given with regard to the changes in railway tariffs. Before April, when the new law went into operation, the tariffs of the three classes, first, second, and third, were respectively proportional to the numbers 182, 136, and 100. Under the new regulations they are proportional to the numbers 228, 156, and 100, the tariff of the third class being represented by 100. Of the total increase of 31,000,000 passengers 27,000,000, or nearly nine-tenths, belong to the third class, and the

second class has gained the other 4,000,000, while the first class has remained stationary. There are two entirely new and suggestive charts devoted to *Les progrès économiques de la France et la mouvement des transports de 1847 a 1892*, and *Le chronotachymètre enregistreur du mouvement des cages dans les puits de mines.*

Statistisches Jahrbuch der Schweiz. Fourth year. 1894. Statistical Bureau of the Department of the Interior. Berne, 1894. Pp. xviii, 444.

Among the special new tables contained in this volume are those giving the numbers of Swiss settled in Germany, Austria, and in France. There is also a table showing the number of accidents in 15 of the principal cities and in the 43 largest arrondissements in 1893. There are nine graphic charts.

Mineral Resources of the United States. 1893. David T. Day, Chief of Division of Mining Statistics. United States Geological Survey. Washington, 1894. Pp. 810.

This brings the statistical report to date of December 31, 1893, with descriptive matter of a later date. This is the tenth report in the series. The statistics of production are generally obtained from the producers, but the statistics of the precious metals are collected and reviewed by the director of the mint, and the coal product of the state of Illinois is collected by the Bureau of Labor of that state. The statistics of the iron and steel industries, collected by Mr. J. M. Swank, for the American Iron and Steel Association, are also used. The total value of the mineral resources of the United States for 1893 was the smallest since 1889. It represented $609,821,670. The greatest decline was in pig iron and structural materials. Bituminous coal showed a slight increase, but the value was less. Petroleum increased in value, but decreased in quantity.

The Tradesman's Annual. Chattanooga, Tenn. Pp. 218. January 1, 1895.

This contains special articles on the manufacturing interests of the South. Among them are "Labor as an Element in Southern Manufactures," by William M. Stewart; "The Mineral Resources of the South," "The Recent Development of the South," by A. C. Stevens of *Bradstreet's*, etc.

The Wool Book and Statistical Manual, Containing Latest Financial Information of the Production, Movement, and Consumption of Wool in all Countries, Textile Schedules of the Tariff of 1894, Manufacturing Tables, etc. By S. N. D. North, Secretary of the National Association of Wool Manufacturers. Boston, 1895. Pp. 142.

This is a second edition of the manual, first issued in 1892. The tables have been enlarged, and many changes have been introduced on account of the new tariff. The present issue has 127 tables, as compared with 107 of the first.

The World Almanac and Encyclopedia, 1895. Pp. 481.

The special features noted in the present edition for the first time are the financial statements of over 360 universities and colleges. Summaries have also been added of the latest reports of receipts and expenditures of railways in the United States and Canada. A tabular history of strikes in the United States is given, as well as the text of the President's proclamation in July, and the regulations of the Government Strike Commission.

A census is given of the population of the principal cemeteries of our great cities. There are also statistics of cremation in the United States from 1876 to 1893, by which it appears that the number cremated during this period was 2699. The number cremated in 1893 was 592. The largest cemetary population is found in Calvary Cemetery, where there have been 500,000 interments since 1848. The next largest reported upon is that of Greenwood, also in Brooklyn, 279,000 interments since 1840.

An estimate has also been made of the present population of each of the states and territories, made by the governors of the several states. This estimate gives a total population of 69,171,707.

CIVIL SERVICE EXAMINATIONS IN STATISTICS.

An interesting indication of the growing recognition of the real place and value of statistical training and education is found in the circular letter issued by the United States Civil Service Commission, at Washington, under date of December 6, 1894.

The Civil Service Commission held an examination on January 15 to fill a vacancy in the position of assistant statistician, Department

of Agriculture, at a salary of $2200 per annum, and to fill several vacancies in the positions of chiefs of sections in the division of statistics, Department of Agriculture, the salaries of which positions are $1600 each per annum.

The subjects of the examination were the same for the assistant statistician and for the chiefs of sections, though the questions differed in some respects, and were of a lighter grade for the chiefs of sections than for the position of assistant statistician. The subjects of the examinations were as follows: Personal questions, the science of statistics, tabulating statistics, analysis of statistics, the literature of statistics, weather, crop, and commercial statistics, and mathematics. The mathematics included questions on the metric system, logarithms, percentage, ratio and proportion, weights and measures, and foreign and domestic currency.

It was stated that the Department would accept no persons for these positions who were not thoroughly educated, and who did not disclose in their examination a good knowledge of the subjects, together with evidence of experience in statistical work, or special study in the science of statistics.